The Naturalist

April 2013
Volume 138
Number 1082

Yorkshire Naturalists' Union

Journal of Natural History for the North of England

The Naturalist

Vol. 138 No. 1082 April 2013

Contents

An asterix* indicates a peer-reviewed paper

Front cover: Hound's-tongue *Cynoglossum officinale*, one of the rare native plants proposed for VC63's Red Data List of plants (see p21). Photo: *J.Simmons*

Back cover: The Rhododendron Leafhopper *Graphocephala fennahi* found at Temple Newsam. It is a new arrival in Yorkshire (see p50). Photo: *J.Bowers*

Yorkshire Naturalists' Union

The Naturalist

April 2013 Volume 138 Number 1082

ditorial

ıy natural history activity, whether it is enjoying the wildlife in our gardens or investigating e ecology or life cycle of one or more taxa, entails identifying the animals, plants and/ fungi so that we know what to call them when we communicate our findings to others. ery species known to science has a scientific name consisting of two parts – a generic ıme and a specific epithet. This is the scientific binomial. The person who realises that he she is looking at something new has the honour of bestowing a name on it, supported a published description. The name of the author and the date of publication become ırt of the formal name. This system was devised and developed by the Swedish botanist ırl von Linnė (Latinised to Linnaeus) and our sytem of nomenclature dates from the ıblication of the tenth edition of his *Systema Naturae* in 1758. One of the insects described this publication is *Papilio machaon* Linnaeus, 1758. Scientific names are controlled by ternational agreement and one of the requirements is that every name is rendered in the ›man alphabet. A worker in Russia, Egypt, China or Japan can write the description in his/ ›r own language but the full scientific name is given in the Roman alphabet.

any animals, plants and fungi also have common or colloquial or vernacular names. *Papilio achaon* occurs widely throughout Europe and the residents of each country have their own ıme for it; in Britain we know it as the Swallowtail Butterfly.

ımes are not fixed and unalterable. Common names may change according to fashion. Sixty ars ago the bird *Prunella modularis* (Linnaeus, 1758) was generally known as the Hedge ›arrow and occasionally as the Hedge Accentor, while the rough types in t'North called it e Dunnock. Today the north country name is the one generally used though either of the hers is quite acceptable – each one is completely unambiguous. Scientific names do not ange through fashion but through research. All the butterflies in the tenth edition of his *stema Naturae* were placed in *Papilio* by Linnė but, as more and more were described from over the world it became evident that some division was needed. The ones with white ngs and smooth green caterpillars were named *Pieris* while the ones with multicoloured ngs and spiky caterpillars were named *Nymphalis*. The specific epithets were not altered

and the author's names and publication dates were placed in brackets to indicate that they had originally been published under a different generic name. Botanists have a similar system for achieving the same ends. As the number of butterflies known from around the world increased, these divisions also became large and unwieldy and were subdivided, but the species originally included in *Pieris* were kept together by creating the name Pieridae to encompass them while the ones previously in *Nymphalis* were placed in the Nymphalidae.

What has all this got to do with *The Naturalist*? Your subscription pays for the publication of every article that we publish and the Editorial Board does not believe that we should publish articles which are designed to exclude you. Every article should be capable of being read and enjoyed by every YNU member and, therefore, we use English names where they exist. We use scientific names when talking to each other and consider them neither jargon nor elitist but it is only good manners to use English names when presenting information to the rest of the YNU membership. The English names we use in *The Naturalist* are those listed on the NBN Gateway. All vascular plants and vertebrates have English names, as do many fungi and invertebrates. Many insects which can be identified on sight do not have English names, which causes a problem to us when we lead guided walks for the public. We sometimes have to make up vernacular names on the spot! Novel English names have been proposed for groups such as mosses, micromoths and soldier flies. They are not generally welcomed by naturalists who study these groups but they are an attempt to demystify the names and reduce the barriers to understanding. Articles dealing with species which do not have vernacular names may be hard work for some readers but that is the nature of the subject. We have no plans for dumbing down such articles.

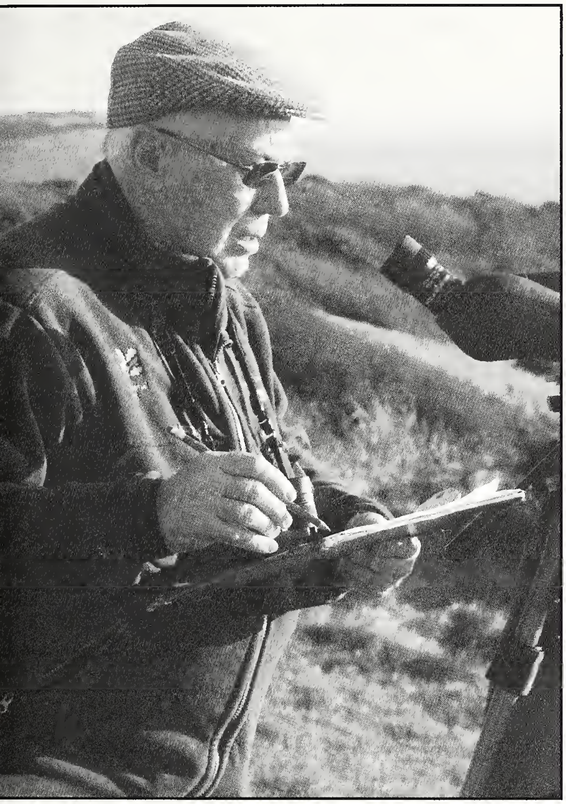
Our policy is to add the scientific name on the first occasion that an English name is used but not thereafter. We also capitalise all English names for ease of understanding – a small white butterfly is very different from a Small White Butterfly! We do not capitalise names where the species have not been identified, such as brambles, oaks and voles. One type of article where this system breaks down is with excursion reports, where any species is likely to be mentioned only once. The Editorial Board feels that scientific names can be dispensed with when dealing with animals such as mammals, birds and butterflies. Should we go further and include vascular plants and/or macromoths? What do you think?

John Newbould: President of the YNU 2012-2013

John spent most of his working life as a community pharmacist running his own business. He qualified in 1966, at a time when you had to know how to make Tincture of Belladonna and Extract of Male Fern and has indeed made them!

He was introduced to wild flowers whilst at primary school and returned to recording them in his 30s. In the 1970s he worked closely with Rotherham Biological Records Centre as a member of Rotherham Naturalists' Society and helped develop the process of moving from a card index to the computer database program Recorder 3 as personal computers became available in the late 1980s.

e joined the Yorkshire Naturalists' Union in 1978, where he was introduced to the wider orld of recording other groups of plants and animals. He was a member of the Yorkshire ildlife Trust's Council from 1984 to 1995, stepping down when appointed Treasurer of the rkshire Naturalists' Union in 1995 – a role he combined with that of Membership Secretary well as General Secretary until November 2011. During most of the years that he was YNU Trustee he has lived in Weymouth, travelling usually once a month to Yorkshire for eetings. One of his lasting legacies is the establishment of the Education Committee, which ganises training for the next generation of naturalists, in particular with Leeds University, well as the Union's annual conference. He has been particularly keen to provide training electronic data entry. He was awarded Honorary Membership of the Union at the AGM in)10.



In Dorset he is Field Secretary of the Dorset Natural History and Archaeological Society; a trustee of Dorset Environmental Records Centre; a member of the National Trust's Cyril Diver Project steering committee which researches the work of the founder of the Nature Conservancy at Studland. He is also a volunteer ecologist with the National Trust, working across Dorset and with the Trust's national consultancy, for whom he has produced a number of conservation evaluation reports. He has been on the Council of the National Federation for Biological Recording since 1999 as Membership Secretary and Treasurer and is currently Secretary. For the past few years he has provided administration for the NFBR Annual Conference, including finding venues. He is a member of the British Ecological Society and an affiliate member of the Institute of Ecology and Environmental Planning.

n 23 November 2012 John was privileged to receive honorary membership of the National odiversity Network Trust in recognition of his long-term, dedicated support for the study of tural history, and especially biological recording, within the volunteer community.

roughout all this administrative workload, he has firmly made sure that he spends time the field every week of the year and ensures that his records arrive with either the ciety recorder or a local records centre on time and in an electronic format. In 2002-5 he ganised YNU surveys of Ripley Park, with particular reference to the stock of veteran trees. r the past few years he has spent some time recording underworked areas in VC65, based Swaledale, in particular looking at plant galls (see p57).

Aquatic plants in Yorkshire canals

R. Goulder 5 Bishops Croft, Beverley HU17 8JY
Email: r.goulder@hull.ac.uk

Introduction

Everyday encounters with canals, in both urban and rural environments, can be positiv experiences and are enhanced by the enjoyment of aquatic vegetation. Luxuriant vegetatior is often to be seen while walking or cycling along towpaths or may be glimpsed from trains o buses. Some lengths of canal in Yorkshire are designated as SSSI because of the conservatior value of their plant communities: e.g. Leeds & Liverpool Canal in Kirkstall Valley Park, Leeds Pocklington Canal; Leven Canal (IWAC, 2008). This reflects the high nature conservation valu that is often associated with canals (Briggs, 1996, 2006, 2012; IWAC, 2008). Other canal length appear to have little botanical interest; for example, the deep, sheer-sided channel of the Air & Calder Navigation between Castleford and Wakefield and the sometimes boat-churned an extremely turbid Leeds & Liverpool Canal at Gargrave.

Yorkshire's diverse canals range from large-scale commercial waterways (e.g. the Aire & Calde and South Yorkshire Navigations) through broad (e.g. the Calder & Hebble Navigation and th Leeds & Liverpool Canal) and narrow canals (e.g. the Huddersfield Narrow Canal and the Sout Yorkshire section of the Chesterfield Canal) used for leisure boating, to disused and largel derelict waterways (e.g. the Barnsley Canal and the Dearne & Dove Canal) (Glister, 2004 Anon, 2006, 2009). They were largely dug in the late 18th and early 19th centuries. Some wer constructed to accommodate wide boats (beam 4.3m) while others were for narrow boat (2.1m) and they have varying histories of usage, dereliction and restoration.

The aim of this contribution is to explore aquatic plants in some Yorkshire canals in the contex of their diverse history and usage. The work described is far from complete: there are severa canals in Yorkshire that I have not visited; moreover I have not walked the full length of th towpaths along most of the canals that I have visited. It is hoped, however, that this pape will stimulate appreciation of the extent of our Yorkshire canal flora and of the need for th inclusion of aquatic plants and their conservation value in decision-making processes tha concern the use and development of canals.

Sites and methods

Aquatic plants were recorded in five canals or canal systems (Table 1). Recording was in May September 2010-2012 at the sites indicated in Table 1. Because plants occupy a continuun from open water through wetland to terrestrial habitats, the problem arises as to which specie should be regarded as aquatic plants. This was resolved by using a checklist which comprise the 184 taxa that Palmer & Newbold (1983) considered to be the aquatic-plant flora of Englan and Wales. In addition the list included all rushes *Juncus* spp. and the post-1990 alien Floatin Pennywort *Hydrocotyle ranunculoides*. Nomenclature is in accordance with Stace (2010) Recording was done by eye from the towpath. Submerged plants were retrieved using eithe a grapnel (with permission from British Waterways) or a walking pole, extensible to 1.5m with a hook attached to its end. Emergent plants that were inaccessible on the far bank wer identified using binoculars. Plants in lock by-pass channels were also recorded. The subjectiv DAFOR abundance scale (Kent, 2012) was used while walking lengths of canal but with specie recorded in only three categories; i.e. dominant/abundant (d/a), frequent (f) or occasional rare (o/r). Alternatively, plants were recorded in 0.5km lengths of canal using the scale: 1 <0.1% cover, 2 = 0.1-5% cover and 3 = >5% cover (Holmes, 1983); there is correspondenc

etween these abundance scales in that (approximately): 1 = o/r; 2 = f; 3 = d/a. The sum of bundance scores (∑A) for each 0.5km of canal was calculated by adding together the scores on the 1-3 abundance scale) of all species recorded. ∑A provided an integrated quantitative epresentation of both species richness and vegetation abundance.

lants recorded

ubmerged and floating-leaved plants found are listed in Table 2. Submerged plants were equently well represented by pondweeds (*Potamogeton* spp.): five species being found in ne Barnsley canals, the Calderdale canals, the Leeds & Liverpool Canal and the Ripon Canal, nd two in the Chesterfield Canal. Of these Flat-stalked Pondweed *Potamogeton friesii* (sparse the Ripon Canal) and Hairlike Pondweed *P. trichoides* (frequent in the Calder & Hebble avigation between Long Cut End Bridge and the junction of the Dewsbury Arm and between nepley Lock and Ledgard Bridge) are predominantly southern species (Preston, 1995) and have limited distribution in Yorkshire. Flat-stalked Pondweed is previously known from the Ripon anal (Abbott, 2005) and Hairlike Pondweed from the Calder & Hebble Navigation around 1940 Lavin & Wilmore, 1994) and the Leeds & Liverpool Canal (Lavin & Wilmore, 1994; Abbott, 005), although I did not find it in the latter canal. Another interesting pondweed was American ondweed *P. epihydrus*, abundant in the Calder & Hebble Navigation along the 3.9km south-astwards from Tuel Lane Tunnel to Salterhebble Top Lock, a species that has been known this canal as a N. American alien since 1907 (Lavin & Wilmore, 1994), although it also has pparently native populations in the Outer Hebrides that were not discovered until 1943-1944 Preston & Croft, 1997).

he floating-leaved Unbranched Bur-reed *Sparganium emersum* and the submerged N. merican alien, Nuttall's Waterweed *Elodea nuttallii*, which was first recorded in the UK in 1966 nd has spread rapidly, were dominant or abundant along parts of all five of the canal systems sited. Other submerged and floating-leaved species that were not recorded in all five canals ere, nevertheless, dominant or abundant at some sites. These included water-starworts *allitriche* spp., Rigid Hornwort *Ceratophyllum demersum*, Frogbit *Hydrocharis morsus-ranae*, oating Pennywort, Common Duckweed *Lemna minor*, Ivy-leaved Duckweed *Lemna trisulca*, piked Water-milfoil *Myriophyllum spicatum* and Yellow Water-lily *Nuphar lutea*. Of these, rogbit, a declining species in Britain (Preston *et al.*, 2002), was locally abundant in the Barugh ranch of the Barnsley Canal. This plant is, however, sold in garden centres and is liable to be iscarded into the wild; hence Wilmore *et al.* (2011) regard South Yorkshire populations as ntroductions. Fringed Water-lily *Nymphoides peltata*, frequent and conspicuous in the Leeds & verpool Canal in central Leeds, presumably has a similar origin. The N. American alien Floating ennywort, first recorded in England in 1990 and rapidly spreading, had colonized the Aire & alder Navigation, being especially abundant in the disused channel west of Fairies Hill Lock, nd had also become established in the Barugh Branch of the Barnsley Canal. A more welcome oating-leaved plant was Floating Water-plantain *Luronium natans*. This has a restricted world istribution and is specially protected within Europe (Preston & Croft, 1997). It is a scarce plant Britain and appears to have spread from oligotrophic waters in Wales north-eastwards along ne canal system in the 19th century (Preston & Croft, 1997). Lavin & Wilmore (1994) believed nat it had recently increased its range in the Calderdale canals and it was sparsely distributed the Calder & Hebble Navigation between Long Cut End Bridge and the Dewsbury Arm by 011, and in 2012 between Brighouse and Cromwell Bottom.

ne emergent plants found are listed in Table 3. Reed Sweet-grass *Glyceria maxima* is a biquitous canal plant and all the canals visited had some marginal vegetation dominated y it. In addition, the whole width of the Barnsley Canal channel was in places occupied by nis species. There were also ten other emergent species that were recorded in all five canal

systems although only five of these were ever recorded as a dominant/abundant component of the flora; i.e. Water-plantain *Alisma plantago-aquatica*, Flowering-rush *Butomus umbellatus*, Soft-rush *Juncus effusus*, Branched Bur-reed *Sparganium erectum* and Amphibious Bistort *Persicaria amphibia*.

Variation between and along canals

In all 65 species of aquatic plant were found. Most species were recorded in the Leeds & Liverpool Canal (45 taxa) followed by the Barnsley canals (38), Ripon Canal (35) and the Calderdale canals (32) and the Chesterfield Canal (29). Thus, the two systems with greatest species richness were the continually navigated Leeds & Liverpool Canal and the derelict Barnsley canals.

Most submerged and floating-leaved species were found in the Barnsley canals (15 taxa) followed by the Calderdale canals and the Leeds and Liverpool Canal (14), the Ripon Canal (12) and the Chesterfield Canal (8) (Table 2) while most emergent ones were found in the Leeds & Liverpool Canal (31 taxa) followed by the Barnsley canals and the Ripon Canal (23), the Chesterfield Canal (21) and the Calderdale canals (18) (Table 3). There were many striking differences in the aquatic vegetation between and along canals.

Barnsley canals

The Barnsley canals had sections where a central, though shallow (<1m) open-water channel persisted, for example parts of the Barnsley Canal north of Shaw Bridge, along the Barugh Branch and the Elsecar and Worsbrough branches of the Dearne & Dove Canal. Sometimes this was known to be because of dredging; e.g. along the Elsecar Branch (Glister, 2004). Submerged/floating vegetation was often luxuriant, and dominant or abundant species in summer 2011 included water-starwort, Rigid Hornwort, Nuttall's Waterweed, Common Duckweed, Spiked Water-milfoil, Fennel Pondweed *Potamogeton pectinatus*, Broad-leaved Pondweed *P. natans*, Unbranched Bur-reed and, only in the Barugh Branch, Frogbit, Floating Pennywort and Ivy-leaved Duckweed. A part of the Barnsley Canal in a deep-shaded cutting north of Shaw Bridge had very shallow water with a monoculture of Common Duckweed forming a complete surface cover. There was usually emergent vegetation of Reed Sweet-grass in the margins and often occupying the full width of the channel (see Plate Ia, centre pages); other sometimes dominant or abundant emergent plants included Sweet-flag *Acorus calamus*, Branched Bur-reed, Bulrush *Typha latifolia* and, in the Barugh Branch, Lesser Water-parsnip *Berula erecta* and Soft-rush. Emergent species recorded, in places, as frequent included Water-plantain, Flowering-rush, Common Marsh-bedstraw *Galium palustre*, Yellow Iris *Iris pseudacorus*, Hard Rush *Juncus inflexus*, Water Mint *Mentha aquatica*, Water Forget-me-not *Myosotis scorpioides*, Water-cress *Nasturtium officinale* agg., Amphibious Bistort and Bittersweet *Solanum dulcamara*.

Calderdale canals

In Calderdale, the Aire & Calder Navigation between Castleford and Wakefield is deep (perhaps 2-3m) and much of the channel has sheer sides. In July 2011 what little aquatic vegetation there was consisted principally of scattered stands of Reed Sweet-grass and Reed Canary-grass *Phalaris arundinacea* at the margins and Floating Pennywort on the water. The exception was about 500m of disused canal between Altofts Lock and the mooring basin west of Fairies Hill Lock, bypassed by the main line of the canal since the 1950s (Taylor, 2003). Here there was much marginal vegetation, principally Reed Sweet-grass with scattered Bulrush, and extensive spreading surface cover of Floating Pennywort. Further up the Calder Valley, the canal sections of the Calder and Hebble Navigation were less deep and boat movements tended to cause turbidity. Over four days (from mid-morning to early afternoon), in July and August 2011 and September 2012, between 4 and 13 boat movements per day were observed. Nevertheless

here was in places substantial submerged/floating vegetation. Submerged/floating species hat were sometimes dominant or abundant included: a water-starwort, Nuttall's Waterweed, merican Pondweed, Broad-leaved Pondweed, Hairlike Pondweed and Unbranched Bur-eed, while species recorded as frequent included Common Duckweed and Lesser Pondweed *otamogeton pusillus*. Where there was marginal vegetation this was dominated by Reed weet-grass; the only other dominant or abundant emergent species were Water-plantain possibly also with Narrow-leaved Water-plantain *Alisma lanceolatum*) in the Dewsbury Branch, lowering-rush between Brighouse and Cromwell Bottom and Arrowhead *Sagittaria sagittifolia* etween Salterhebble and Sowerby Bridge. Also conspicuous in the Dewsbury Branch, and ecorded as frequent, were Sweet-flag, Hemlock Water-dropwort *Oenanthe crocata* and ulrush (see Plate Ic, centre pages).

hesterfield Canal

he Chesterfield Canal, observed in May and June 2010, tended to have turbid water stirred p by boats. Submerged/floating plants that were in places dominant or abundant (i.e. 5% cover over 0.5km of canal) were a water-starwort, Nuttall's Waterweed, Broad-leaved ondweed, Fennel Pondweed and Unbranched Bur-reed. The only dominant or abundant mergent marginal species was Reed Sweet-grass, while species sometimes recorded as requent (i.e. 0.1-5% cover over 0.5km of canal) were Water-cress, Amphibious Bistort and ranched Bur-reed. Detailed information on the distribution of aquatic plants was collected for .5km lengths along 7.0km of canal east of Norwood Tunnel (Table 4). There was substantial ocal variation along the canal; species richness per 0.5km ranged from 2 to 6 for submerged/ oating plants, from 3 to 14 for emergent species, and from 6 to 17 for all aquatic plants. ven more striking was variation in the sum of abundance scores ($\sum A$) for each 0.5km of canal. A ranged from 2 to 11 for submerged/floating species, from 3 to 15 for emergent ones and rom 8 to 19 for all aquatics. Low species richness and low $\sum A$, for example from 2.5-3.5km ast of Norwood Tunnel, were associated with tree shading and high water turbidity. The high alues immediately east (0-0.5km) of Norwood Tunnel were related to a diversity of emergent pecies growing in a muddy area adjacent to the blocked-up tunnel mouth and to abundant ubmerged/floating-leaved vegetation in the transparent water of this largely unnavigated stub nd of canal. Other high values of species richness and $\sum A$, for example from 4.5-5.5km east f Norwood Tunnel, were due to a diversity of plants growing in lock by-pass channels. Thus, ver the length 5.0-5.5km, the lock by-passes and associated structures supported Creeping ent *Agrostis stolonifera*, Fool's-water-cress *Apium nodiflorum*, Lesser Water-parsnip, Marsh-narigold *Caltha palustris*, Soft-rush, Hard Rush, Water Mint, Water-cress, Amphibious Bistort, eed Canary-grass, Bittersweet, Lesser Bulrush *Typha angustifolia* (introduced in coir rolls used or bank stabilization) and Brooklime *Veronica beccabunga*.

eeds & Liverpool Canal

he Leeds & Liverpool Canal between Gargrave and Skipton, when visited in June-August 2010, ad highly turbid water linked to substantial boat traffic; boat movements observed over three ays in the field ranged from 8-21 per day. There was only a limited presence of submerged/ oating plants. Fennel Pondweed was sometimes frequent (i.e. 0.1-5% cover over 0.5km of anal) but otherwise there were only occasional patches of floating-leaved Unbranched Bur-eed and largely loose fragments of Nuttall's Waterweed, Spiked Water-milfoil and Lesser ondweed to be seen. Emergent vegetation was intermittent, largely on the far side from the ow-path; only Reed Sweet-grass was ever dominant or abundant while Greater Pond-sedge *arex riparia* and/or Lesser Pond-sedge *Carex acutiformis* were sometimes frequent (both pecies were present but were not easily separable through binoculars when growing on the far de of the canal). Detailed information on aquatic plants in 0.5km lengths along 6km of canal ast of Priest Holme Railway Bridge emphasized the paucity of submerged/floating vegetation

(Table 5). The number of species (0-5) and $\sum A$ (0-6) per 0.5km were very low. Species richness of emergent plants was greater and showed more variation along the canal; the number of emergent taxa ranged from 3-20 and $\sum A$ from 4-23 per 0.5km of canal. Thus species richness (4-25) and $\sum A$ (5-29) per 0.5km for all aquatic taxa also showed considerable variation. Essentially the main channel of this stretch of canal appeared to be a relatively inhospitable environment for aquatic plants, possibly because of high turbidity, the frequent presence of vertical margins and intermittent tree shading (see Plate Id, centre pages). Higher values of species richness and $\sum A$ tended to be associated with ancillary features:

1. Lock by-pass channels, e. g. in lengths 0-0.5km and 0.5-1km east of Priest Holme Railway Bridge. Creeping Bent, Flowering-rush, Reed Sweet-grass, Water Forget-me-not, Water Mint, Water-cress, Hemlock Water-dropwort and Reed Canary-grass were recorded in by-pass channels (see Plate Ib, centre pages).
2. Winding holes (broadenings of the canal allowing boats to turn), e.g. in lengths 2-2.5km and 3-3.5km. Sweet-flag, Creeping Bent, Marsh-marigold, Lesser Pond-sedge, Floating Sweet-grass *Glyceria fluitans*, Reed Sweet-grass, Hard Rush, Tufted Forget-me-not *Myosotis laxa*, Water Forget-me-not, Water-cress, Amphibious Bistort, Reed Canary-grass, Blue Water-speedwell *Veronica anagallis-aquatica* and Brooklime were recorded in winding holes.
3. Cattle-poached margin, e.g. in length 3.5-4km. Sweet-flag, Marsh-marigold, Floating Sweet-grass, Reed Sweet-grass, Hard Rush, Water Mint, Water Forget-me-not, Water-cress, Hemlock Water-dropwort, Celery-leaved Buttercup *Ranunculus sceleratus* and Brooklime were recorded in margins that appeared to have been poached by cattle on the far side from the towpath.

The Leeds & Liverpool Canal between Apperley Bridge and central Leeds, when visited in July and September 2011, was a friendlier habitat for aquatic plants than the canal between Gargrave and Skipton. Although fewer aquatic species in total were recorded between Apperley Bridge and Leeds (12 submerged/floating, 18 emergent) than between Gargrave and Skipton (6 submerged/floating, 30 emergent) the number of submerged/floating species recorded was much greater as was the luxuriance of the vegetation, especially the submerged/floating vegetation. The water was more or less transparent which was probably because of seemingly low boat traffic; only 4 boat movements between Apperley Bridge and Newlay Bridge (6.3km) on 6 July and none between Newlay Bridge and Leeds Canal Basin (7.6km) on 1 September, although traffic density will vary with season and day of the week. Submerged/floating species that were sometimes dominant/abundant included Nuttall's Waterweed, Fennel Pondweed, Perfoliate Pondweed *Potamogeton perfoliatus* and Unbranched Bur-reed, while species recorded as sometimes frequent included Broad-leaved Pondweed, Lesser Pondweed and Fringed Water-lily. In addition, Arrowhead, although herein generally considered to be an emergent plant (Table 3), sometimes dominated the whole width of the channel with its strap-shaped submersed leaves. Much of the canal has sheer sides, especially on the towpath side; hence marginal vegetation tended to thrive more alongside the far bank except where tree-shaded. Reed Sweet-grass was the dominant species although Flowering-rush, Hemlock Water-dropwort and Bulrush were sometimes frequent. Also dominant/abundant was emergent Arrowhead which formed a broad band of emergent leaves either side of the central channel along much of the canal.

Ripon Canal

The Ripon Canal had more or less transparent water when visited on 4 and 18 May but was moderately turbid on 26 May 2011. This was probably related to boat traffic; there were no boat movements on 4 May, 3 on 18 May and 4 on 26 May. Submerged/floating species that were in places dominant/abundant included Nuttall's Waterweed, Yellow Water-lily, Fennel Pondweed and Unbranched Bur-reed. Also, Amphibious Bistort, which was generally regarded

; an emergent species (Table 3), was dominant/abundant as a floating-leaved plant towards ie south-east end of the canal. Submerged/floating species that were, in places, frequent ere water-starworts, Broad-leaved Pondweed, Perfoliate Pondweed and an unidentified, non-owering, batrachian water-crowfoot *Ranunculus* sp. Much of the first 3.0km of canal from pon Basin has sheer sides and/or is shaded, hence there was limited marginal vegetation. o species was dominant/abundant though Lesser Pond-sedge, Reed Sweet-grass, Yellow Iris id Reed Canary-grass were sometimes frequent (i.e. 0.1-5% cover in a 0.5km length of canal). nergent plants were much more evident in the final 0.5km of canal before its junction with e River Ure. This section was not shaded and had a fringe of emergent vegetation about n wide alongside the tow-path. The most important component was Common Club-rush *:hoenoplectus lacustris* although Lesser Pond-sedge was also dominant/abundant. Other nergent species that were frequent in this marginal fringe were Yellow Iris and Branched ır-reed.

more quantitative analysis of the records along the Ripon Canal (Table 6) emphasized that ecies richness and abundance of both submerged/floating and emergent plants were arkedly greater in the less shaded final 1km before the junction with the River Ure than in the itial 2.5km of canal. Thus 8-10 taxa (3-5 submerged/floating, 3-7 emergent) per 0.5km along e initial 2.5km of canal increased to 23-27 taxa (8 submerged/floating, 15-19 emergent) per 5km along the final 1km of canal. Furthermore, *∑A* for all taxa increased from 10-16 (5-9 for ıbmerged/floating species, 4-10 for emergent species) per 0.5km to 34-41 (14 submerged/ əating, 20-27 emergent) per 0.5km.

iscussion

early the five canals that were studied, with species richness ranging from 29 to 45, were all significant resource for aquatic plants notwithstanding their different histories and usage. f the 65 species of aquatic plant recorded (Tables 2 & 3) 61 are on the checklist published / Palmer & Newbold (1983); i.e. 33% of the England and Wales aquatic flora. The number f species found in some of these canals approached or exceeded the number of vascular quatic plant species recorded in high-conservation-value SSSI canals in East Yorkshire; i.e. 44 the Pocklington Canal (Goulder, 2003) and 39 in the Leven Canal (Goulder, 2006). Most also ‹ceeded the 32 (checklist) species recorded along 12km of the Huddersfield Narrow Canal 1978 (Morphy *et al.*, 1980) prior to its restoration. Furthermore some of the native species resent had international (Floating Water-plantain) or national (Flat-stalked Pondweed, Hairlike ɔndweed) scarcity value.

fferences in abundance of vegetation between and along the canals were clearly related usage and management. The number of boats using the canals will vary with day of e week, season and weather: only limited visits were made to each canal, and never at eekends, hence the full extent of boat traffic was not seen. Nevertheless, it appeared that ɔme lengths of canal had more boat movements and high turbidity. It is well known that ere is a negative relationship between boat traffic and abundance of aquatic vegetation in ıglish canals (Murphy & Eaton, 1983). Suppression of plant growth is due to reduction in ;ht penetration and underwater photosynthesis caused by high turbidity and to mechanical ımage of plants, although the latter can aid dispersal – loose rafts of plants can sometimes : seen accompanying boats through locks. Further potentially negative pressures were the evalence of sheer sides, discouraging emergent vegetation, and inhibition of photosynthesis ' tree shading. Suppression of aquatic plants, especially submerged/floating ones, seems to ıve been important in the Chesterfield Canal and the Gargrave to Skipton section of the Leeds Liverpool Canal (Tables 4 & 5). At those sites the number of species per 0.5km was low,

although it is possible that there was some under-recording of submerged species because o the high turbidity. Mean values for submerged/floating species were only 3.7 taxa per 0.5km o canal in the Chesterfield Canal and 1.9 taxa per 0.5km in the Leeds & Liverpool Canal betweer Gargrave and Skipton. These contrasted, for example, with non-navigated or lightly navigatec canals in East Yorkshire; i.e. means of 7.4 taxa per 0.5km in the Pocklington Canal, 5.6 taxa per 0.5km in the Driffield Canal (Goulder, 2003) and 14.5 taxa per 0.5km in the Leven Cana (Goulder, 2006) – although these include some non-vascular green plants (the bryophyte: *Fontinalis antipyretica* and *Riccia fluitans*, and charophytes).

Willby & Eaton (1996) showed that biomass and diversity of plants in navigable canals, especiall emergent plants, were greater in backwaters than in the main channel (backwaters being defined as places where there was a >50% increase in channel width). In the present study i was also observed that off-line refuges became important when plants were suppressed in the main channel. These included lock by-pass channels on the Chesterfield Canal and the Leeds & Liverpool Canal, and winding holes and cattle-poached margin on the Leeds & Liverpool Canal The success of such refuges is serendipitous but it perhaps offers support for the constructior of artificial refuges (described, for example, by Boedeltje *et al.*, 2001 and Briggs, 2006) along canals where vegetation is liable to suffer from restoration of navigation or increased boa traffic. However, the careful management of off-line features that are an existing integral par of the canal is easier than construction of new features. Hence lock by-pass channels are bette kept with bottoms of gravel or of jointed masonry, to provide a hold for plant roots, rather thar being concreted, and it might be better to keep winding holes free of tree shading.

The Apperley Bridge to Leeds section of the Leeds & Liverpool Canal, the canal sections of the Calder & Hebble Navigation and the Ripon Canal in places supported abundant and diverse aquatic vegetation including submerged/floating species. Although used by boats these length appeared to be less troubled by boat traffic than, for example, the Leeds & Liverpool Cana between Gargrave and Skipton. These observations accord with work by Willby *et al.* (1998 which showed that intermediate biomass and high species richness of submerged/floating species tend to coexist in regions of light to moderate boat traffic. Furthermore, Willby & Eator (1993) specifically linked the persistence of Floating Water-plantain in canals to disturbanc associated with light boat traffic. It is possible that boats moving on the Leeds & Liverpoo Canal between Gargrave and Skipton tended to be making short trips, to and fro from fixe moorings along a length of canal with few locks, and did not make the long-distance journey t Leeds that involves passage through many locks. Similar self-regulation of traffic in response t heavy lockage has been observed on the Rochdale Canal which links with the Calder & Hebbl Navigation at Sowerby Bridge. In that canal, which was restored and reopened to through traffi in 2002, there is vegetation of high conservation value along 19km of SSSI, including Floatin Water-plantain and nine species of pondweeds *Potamogeton* spp., which benefits from sel regulation of boat traffic by heavy lockage (Leach, 2008).

Some sections of the disused Barnsley canals look to be idyllic from the perspective of wildlif conservation (Lavelle, 2002; Hutton, 2011). This is especially so where there is open wate which often has abundant and diverse submerged/floating vegetation, between marginal strip of emergent vegetation; for example in places on the Barugh Branch and the Barnsley Cana north of Shaw Bridge. This valuable habitat is, however, likely to be transient because the fu width of the channel has become occupied by species-poor emergent vegetation consistin largely of Reed Sweet-grass in much of these canals. The maintenance of open water habita is probably dependent on clearance of emergent vegetation and/or dredging which might, fc example, be undertaken to facilitate angling, industrial water supply, boating or wildlife intere:

or for visual amenity. Thus Willby *et al.* (1998) emphasize that maximum species richness in non-navigated canals, together with intermediate plant biomass, is likely to follow interventionist management such as weed cutting or dredging.

The diverse aquatic plants and vegetation, with their important wildlife conservation value, that were observed in this study occupied canals that are also valuable for many other reasons. Yorkshire's canals are important for their history and industrial archaeology and are a resource for outdoor learning and teaching. The Chesterfield Canal, for instance, was maintained for many years as a water supply to industries in Worksop. They are also the focus of much leisure activity. The wide range of this activity includes boating, working on and enjoying moored boats, canoeing, angling, walking, running and cycling, botanizing and birding, outdoor-sculpture appreciation, beer gardens and *al fresco* café culture. Taken together these uses are of significant economic value. There is, however, the potential for conflict between different users. The conflict between canal restoration, boating and wildlife conservation is well known (Briggs, 1996, 2006) but it is possible to achieve balance (IWAC, 2008). Although there was in places evidence of suppression of aquatic plants by boats in Yorkshire canals, it is clear that elsewhere boats and plants co-existed. Certainly the continuance of navigation and the restoration of disused waterways have saved some canals from the fate of infilling and development that has befallen much of the Barnsley canal system.

Table 1. Yorkshire canals and sites where aquatic plants were recorded.

Canal or canal system	Recording sites
Barnsley canals (Barnsley Canal and Dearne & Dove Canal). This broad-canal system linked the River Calder near Wakefield through Barnsley to the Sheffield and South Yorkshire Navigation at Swinton (about 40km). Branches served Barugh, Worsbrough and Elsecar. The system closed to navigation in stages between about 1906 and 1952 and became derelict (Russell, 1983; Glister, 2004). Approximately half of the system is now dry or in-filled, elsewhere water levels are maintained by fixed weirs for angling or industrial water supply, or the canal bed is a wet ditch often extensively occupied by emergent aquatic vegetation.	Barnsley Canal from Shaw Bridge (Grid Ref. SE372101) northwards for 7.5km through Royston Bridge and on towards Walton; the Barugh Branch from Smithy Bridge (SE347079) north-westwards for 2.1km. Dearne & Dove Canal from near Everill Gate Bridge (SE409025) north-westwards for 1.0km; the Elsecar Branch from Elsecar Basin (SE387001) north-eastwards for 3.3km; the Worsbrough Branch from Worsbrough Basin (SE352034) eastwards for 0.4km. In all 14.3km of canal.
Calderdale canals (Aire & Calder Navigation and Calder & Hebble Navigation). This waterway, which extends for about 43km from Castleford via Wakefield and Brighouse to Sowerby Bridge, is a mixture of broad-gauge canal and river navigations. The canal sections make up about 34km, plus there are truncated branches that formerly reached Dewsbury and Halifax. The waterway has been continuously open to navigation although it appears now to be used only by leisure traffic.	Aire & Calder Navigation from Fairies Hill Lock, Castleford (SE396249) south-westwards for 7.1km to Broadreach Lock at Wakefield. Calder & Hebble Navigation: from Mill Bank Lock (SE259193) 3.3km westwards to Long Cut End Bridge, and the Dewsbury Arm (1.2km); from Shepley Lock (SE215198) 1.5km westwards to Ledgard Bridge at Mirfield; from the A641 bridge at Brighouse (SE147227) 2.7km westwards to Cromwell Bottom; from Long Lees Viaduct (SE100217) 4.8km north-westwards to Tuel Lane Tunnel at Sowerby Bridge; the Salterhebble (Halifax) Arm (0.5km). In all 21.1km of canal.

Canal or canal system	Recording sites
Chesterfield Canal. This linked Chesterfield to the River Trent. A South Yorkshire section (5.5km) between the eastern portal of Norwood Tunnel and Shireoaks is narrow gauge. Through traffic ceased following the collapse of the tunnel in 1907 and the canal became derelict (Russell, 1983).This section of canal was restored for leisure navigation between 1995 and 2003.	From Norwood Tunnel portal (SK500825) at Kiveton Park for 7.0km eastwards to beyond Shireoaks.
Leeds & Liverpool Canal. This broad gauge canal, now used only for leisure navigation, has been continuously open to traffic. About 62km of the canal, from its junction with the River Aire in Leeds, is in Yorkshire.	From Priest Holme Railway Bridge (SD918539) at Gargrave for 6.0km eastwards towards Skipton; from Apperley Bridge (SE194377) south-eastwards for 13.9km to Leeds Canal Basin. In all 19.9km of canal.
Ripon Canal. This short (3.5km) broad canal links Ripon to the River Ure. Commercial traffic had ceased by the end of the 19th Century (Hadfield, 1973) and the canal became derelict. Restoration for leisure navigation was completed by 1996.	The whole 3.5km from Ripon Basin (SE315708) south-eastwards to the River Ure.

Table 2. Submerged and floating-leaved aquatic plants recorded in Yorkshire canals; May-September 2010-2012.

	Barnsley canals	Calderdale canals	Chesterfield Canal	Leeds & Liverpool Canal	Ripon Canal
Azolla filiculoides (Water Fern)	-	+	-	-	-
Callitriche spp. (water-starworts)	+	+	+	-	+
Ceratophyllum demersum (Rigid Hornwort)	+	-	+	-	-
Elodea canadensis (Canadian Waterweed)	-	-	-	-	+
E. nuttallii (Nuttall's Waterweed)	+	+	+	+	+
Hydrocharis morsus-ranae (Frogbit)	+	-	-	-	-
Hydrocotyle ranunculoides (FloatingPennywort)	+	+	-	-	-
Juncus bulbosus (Bulbous Rush)	-	+	-	-	-
Lemna gibba (Fat Duckweed)	-	+	-	-	-
L. minor (Common Duckweed)	+	+	+	+	-
L. trisulca (Ivy-leaved Duckweed)	+	-	-	+	-
Luronium natans (Floating Water-plantain)	-	+	-	-	-
Myriophyllum spicatum (Spiked Water-milfoil)	+	-	+	+	+
Nuphar lutea (Yellow Water-lily)	-	-	-	+	+
Nymphaea alba (White Water-lily)	+	-	-	+	-
Nymphoides peltata (Fringed Water-lily)	-	-	-	+	-
Potamogeton crispus (Curled Pondweed)	+	+	-	+	-
P. epihydrus (American Pondweed)	-	+	-	-	-
P. friesii (Flat-stalked Pondweed)	-	-	-	-	+
P. natans (Broad-leaved Pondweed)	+	+	+	+	+
P. pectinatus (Fennel Pondweed)	+	-	+	+	+
P. perfoliatus (Perfoliate Pondweed)	+	-	-	+	+

	Barnsley canals	Calderdale canals	Chesterfield Canal	Leeds & Liverpool Canal	Ripon Canal
P. pusillus (Lesser Pondweed)	+	+	-	+	+
P. trichoides (Hairlike Pondweed)	-	+	-	-	-
Ranunculus sp.* (Water-crowfoot)	-	-	-	-	+
Sparganium emersum (Unbranched Bur-reed)	+	+	+	+	+
Zannichellia palustris (Horned Pondweed)	-	-	-	+	-
n of submerged and floating-leaved taxa	**15**	**14**	**8**	**14**	**12**

(+) indicates present, (-) indicates not recorded. *An unidentified batrachian *Ranunculus* sp.

Table 3. Emergent aquatic plants recorded in Yorkshire canals; May-September 2010-2012

	Barnsley canals	Calderdale canals	Chesterfield Canal	Leeds & Liverpool Canal	Ripon Canal
Acorus calamus (Sweet-flag)	+	+	-	+	-
Agrostis stolonifera (Creeping Bent)	+	+	+	+	+
*Alisma plantago-aquatica** (Water-plantain)	+	+	+	+	+
Apium nodiflorum (Fool's-water-cress)	-	-	+	-	-
Berula erecta (Lesser Water-parsnip)	+	-	+	+	+
Butomus umbellatus (Flowering-rush)	+	+	+	+	+
Caltha palustris (Marsh-marigold)	-	-	+	+	+
Carex acutiformis (Lesser Pond-sedge)	-	-	-	+	+
C. riparia (Greater Pond-sedge)	-	-	-	+	+
C. nigra (Common Sedge)	-	-	-	+	-
Eleocharis palustris (Common Spike-rush)	+	-	-	+	-
Equisetum fluviatile (Water Horsetail)	+	-	-	-	+
E. palustre (Marsh Horsetail)	-	-	-	-	+
Galium palustre (Common Marsh-bedstraw)	+	+	-	+	-
Glyceria fluitans (Floating Sweet-grass)	-	-	-	+	+
G. maxima (Reed Sweet-grass)	+	+	+	+	+
Hippuris vulgaris (Mare's-tail)	-	-	-	-	+
Iris pseudacorus (Yellow Iris)	+	+	+	+	+
Juncus articulatus (Jointed Rush)	+	-	-	+	-
J. conglomeratus (Compact Rush)	+	-	-	-	-
J. effusus (Soft-rush)	+	+	+	+	+
J. inflexus (Hard Rush)	+	-	+	+	+
Mentha aquatica (Water Mint)	+	+	+	+	+
Myosotis laxa (Tufted Forget-me-not)	-	-	-	+	-
M. scorpioides (Water Forget-me-not)	+	-	+	+	+
Nasturtium officinale agg. (Water-cress)	+	+	+	+	-
Oenanthe crocata (Hemlock Water-dropwort)	-	+	-	+	+
Persicaria amphibia (Amphibious Bistort)	+	+	+	+	+
Phalaris arundinacea (Reed Canary-grass)	+	+	+	+	+
Ranunculus sceleratus (Celery-leaved Buttercup)	+	+	+	+	-
Sagittaria sagittifolia (Arrowhead)	-	+	-	+	-
Schoenoplectus lacustris (Common Club-rush)	-	-	+	-	+
Solanum dulcamara (Bittersweet)	+	+	+	+	+

	Barnsley canals	Calderdale canals	Chesterfield Canal	Leeds & Liverpool Canal	Ripon Canal
Sparganium erectum (Branched Bur-reed)	+	+	+	+	+
Typha angustifolia (Lesser Bulrush)	-	-	+	-	-
T. latifolia (Bulrush)	+	+	-	+	-
Veronica anagallis-aquatica (Blue Water-speedwell)	-	-	-	+	-
V. beccabunga (Brooklime)	-	-	+	+	-
***n* of emergent taxa**	23	18	21	31	23

(+) indicates present, (-) indicates not recorded. **Alisma lanceolatum* (Narrow-leaved Water-plantain) may sometimes have also been present

Table 4. Species richness and sum of abundance scores (∑*A*) for aquatic plants in the Chesterfield Canal; May-June 2010.

	Distance eastwards from Norwood Tunnel portal (km)													
	0-0.5	0.5-1	1-1.5	1.5-2	2-2.5	2.5-3	3-3.5	3.5-4	4-4.5	4.5-5	5-5.5	5.5-6	6-6.5	6.5-7
Submerged and floating-leaved species:														
n of taxa	6	6	5	4	3	3	3	4	2	2	3	4	3	5
∑*A*	11	8	10	5	5	4	4	4	2	3	4	6	4	7
Emergent species:														
n of taxa	6	3	5	3	5	3	3	8	9	9	14	5	4	5
∑*A*	7	3	5	5	7	5	4	9	11	12	15	7	5	7
All aquatic species:														
n of taxa	12	9	10	7	8	6	6	12	11	11	17	9	7	10
∑*A*	18	11	15	10	12	9	8	13	13	15	19	13	9	14

Table 5. Species richness and sum of abundance scores (∑*A*) for aquatic plants in the Leeds & Liverpool Canal; June-August 2010.

	Distance eastwards from Priest Holme Railway Bridge, Gargrave (km)											
	0-0.5	0.5-1	1-1.5	1.5-2	2-2.5	2.5-3	3-3.5	3.5-4	4-4.5	4.5-5	5-5.5	5.5-6
Submerged and floating-leaved species:												
n of taxa	1	3	1	0	0	0	2	5	2	3	4	2
∑*A*	1	3	1	0	0	0	3	6	3	3	4	2
Emergent species:												
n of taxa	16	9	3	5	15	6	14	20	19	10	12	7
∑*A*	16	11	4	5	16	7	17	23	23	12	14	7
All aquatic species:												
n of taxa	17	12	4	5	15	6	16	25	21	13	16	9
∑*A*	17	14	5	5	16	7	20	29	26	15	18	9

Carex acutiformis/riparia scored as one taxon.

Table 6. Species richness and sum of abundance scores (∑*A*) for aquatic plants in the Ripon Canal; May 2011.

	Distance southwards from Ripon Basin (km)						
	0-0.5	0.5-1	1-1.5	1.5-2	2-2.5	2.5-3	3-3.5
Submerged and floating-leaved species							
n of taxa	5	3	3	4	5	8	8
∑*A*	9	6	5	6	9	14	14
Emergent species							
n of taxa	3	6	7	4	5	15	19
∑*A*	4	10	8	4	7	20	27
All aquatic species							
n of taxa	8	9	10	8	10	23	27
∑*A*	13	16	13	10	16	34	41

:knowledgements

ım grateful for the encouragement of (the former) British Waterways and the Canal & ver Trust, and to Dr Alistair Anderson for his helpful comments on the manuscript.

ɛferences

ɔbott, P.P. (2005) *Plant Atlas of Mid-west Yorkshire*. Yorkshire Naturalists' Union, York.

ıon. (2006) *Waterways Guide 6: Nottingham, York & the North East* (new ed.). Collins-Nicholson, London.

ıon. (2009) *Waterways Guide 5: North West & the Pennines* (new ed.). Collins-Nicholson, Cheltenham.

ɔedeltje, G., Smolders, A.J.P., Roelofs, J.G.M. and van Groenendael, J.M. (2001) Constructed shallow zones along navigation canals: vegetation establishment and change in relation to environmental characteristics. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 11, 453-471.

iggs, J. (1996) Canals – wildlife value and restoration issues. *British Wildlife*, 7, 365-377.

iggs, J. (2006) The saga of the Montgomery Canal. *British Wildlife*, 17, 401-410.

iggs, J. (2012) Canals under new management: a review of wildlife value, issues and opportunities. *British Wildlife*, 23, 314-323.

ister, R. (2004) *The Forgotten Canals of Yorkshire: Wakefield to Swinton via Barnsley*. Wharncliffe Books, Barnsley.

ɔulder, R. (2003) Aquatic plants in the Pocklington and Driffield canals with regard to the potential extension of navigation. *The Naturalist*, 128, 129-146.

ɔulder, R. (2006) Aquatic plants in the Leven Canal, East Yorkshire: does the waterway continue to be an important site for botanical conservation? *The Naturalist*, 131, 77-82

ıdfield, C. (1973) *The Canals of Yorkshire and North East England* (Vol. 2). David & Charles, Newton Abbot.

ɔlmes, N.T.H. (1983) *Focus on Nature Conservation No. 4: Typing British Rivers According to their Flora*. Nature Conservancy Council, Shrewsbury.

ıtton, C. (2011) Wildlife on the waterways. *Wildlife Yorkshire*, Winter, 7.

'AC (2008) *Britain's Inland Waterways: Balancing the Needs of Navigation and Aquatic Wildlife*. Inland Waterways Advisory Council, London.

nt, M. (2012) *Vegetation Description and Data Analysis: a Practical Approach* (2nd ed.). Wiley-Blackwell, Chichester.

velle, B. (2002) Hidden costs of canal restoration. *Yorkshire Wildlife*, Winter-Spring, 7.

vin, J.C. and Wilmore, G.T.D. (1994) *The West Yorkshire Plant Atlas*. City of Bradford Metropolitan Council, Bradford.

ach, J. (2008) Case study 10: Rochdale Canal. In *Britain's Inland Waterways: Balancing the Needs of Navigation and Aquatic Wildlife*, 142-146. Inland Waterways Advisory Council, London.

ɔrphy, M.J., Thomas, J. and Higgins, B. (1980) Macrophytes of the Huddersfield Narrow Canal – a

preliminary survey. *The Naturalist*, 105, 135-139.
Murphy, K.J. and Eaton, J.W. (1983) Effects of pleasure-boat traffic on macrophyte growth in canals. *Journal of Applied Ecology*, 20, 713-729.
Palmer, M. and Newbold, C. (1983) *Focus on Nature Conservation No. 1: Wetland and Riparian Plants in Great Britain.* Nature Conservancy Council, Shrewsbury.
Preston, C.D. (1995) *Pondweeds of Great Britain and Ireland.* Botanical Society of the British Isles, London.
Preston, C.D. and Croft, J.M. (1997) *Aquatic Plants in Britain and Ireland.* Harley Books, Colchester.
Preston, C.D., Pearman, D.A. and Dines, T.D. (2002) *New Atlas of the British & Irish Flora.* Oxford University Press, Oxford.
Russell, R. (1983) *Lost Canals and Waterways of Britain* (revised ed.). Sphere Books, London.
Stace, C.A. (2010) *New Flora of the British Isles* (3rd ed.). Cambridge University Press, Cambridge.
Taylor, M. (2003) *The Canal & River Sections of the Aire & Calder Navigation.* Wharncliffe Books, Barnsley.
Willby, N.J. and Eaton, J.W. (1993) The distribution, ecology and conservation of *Luronium natans* (L Raf. in Britain. *Journal of Aquatic Plant Management*, 31, 70-76.
Willby, N.J. and Eaton, J.W. (1996) Backwater habitats and their role in nature conservation on navigable waterways. *Hydrobiologia*, 340, 333-338.
Willby, N.J., Pygott, J.R. and Eaton, J.W. (1998) Inter-relationships between biomass, species richnes and conservation value of hydrophyte communities in artificial waterways. *10th European Weed Research Council Symposium on Aquatic Weeds, Lisbon*, 227-230.
Wilmore, G.T.D., Lunn, J. and Rodwell, J.S. (2011) *The South Yorkshire Plant Atlas.* Yorkshire Naturalists' Union, York.

An interesting plant gall on Gorse

Derek Parkinson 11 Crow Tree Close, Baildon, Shipley, West Yorkshire, BD17 6JH.
Email: derekparkinson@blueyonder.co.uk

On the 1 February 2013 I was searching the Gorse *Ulex europaeus* on Baildon Moor for mot larvae. I was particularly looking for the caterpillars of *Scotopteryx* (Geometridae) as a ve rarely collected parasitoid *Aleiodes* (Braconidae, Rogadinae) uses the July Belle moth as host. It seems quite likely that Lead Belle is an alternative host and Baildon Moor is whe the only known Yorkshire specimen of this moth was captured in 1897.
I noticed that one of the Gorse stems was swollen and, suspecting this to be a gall, I c the stem in two to reveal an insect larva. I took photographs of the gall and larva (see Pla II, centre pages) and posted these onto the internet forum of the British Plant Gall Socie (British Galls Yahoogroup). Within an hour, Keith Palmer posted a reply suggesting that th galls were likely to be caused by the seed weevil *Stenopterapion scutellare*.

There are still a few galls visible on the Gorse bush and I hope to harvest these later in th year in order to see the adult beetle.

Andricus gemmeus – a new gall for Yorkshire

Tom Higginbottom 5 Spennithorne Road, Skellow, Doncaster, South Yorkshire, DN6 8PF.
Email: tomhig@talktalk.net

On Saturday 13 October 2012 I presented photographs of some recent interesting Yorkshire galls to a YNU Entomological Section indoor meeting at Doncaster Museum. I included a photograph of the agamic generation of *Andricus gemmeus*, caused by a gall wasp on Pedunculate Oak *Quercus robur.* It had been first recorded in Britain by Jerry Bowdrey in Colchester Cemetery in October 2008 during an invertebrate survey. Further research indicated that this insect had been spreading north-westwards across Europe, so it was not surprising that it had finally been recorded in Britain. In September 2012 I received an email from Jerry Clough giving details of where he had found this gall at four different sites in Clumber Park. I thought the arrival of *A. gemmeus* in Yorkshire must be imminent!

On the following day, Sunday 14 October, the Doncaster Naturalists' Society gathered at Scabba Wood for the fungus foray. This privately owned woodland is near Sprotbrough Flash Nature Reserve and approximately one square kilometre in area. Ian Farmer and I decided to record the galls rather than the fungi. To our amazement *A. gemmeus* was found on three different trees in the woodland and also on an oak in the garden of the owners. These are the first Yorkshire records. The galls were found on mature oaks bordering different rides within the wood. The galls are roughly spherical in shape and covered in small conical protuberances and often appear on epicormic shoots growing from the trunk of mature Pedunculate Oak. The Yorkshire galls have all been yellow in colour but more mature specimens seen in other parts of the country often have reddish tints at the tip.

Table 1. *Andricus gemmeus* in Scabba Wood

Grid Reference	No. of galls
SE52545 01301	2
SE52576 01475	2
SE52231 01701	5
SE52868 01310	8

On 23 October *A. gemmeus* was recorded on two separate trees at Denaby Ings SE5000. On 3 November in Sandall Park SE6005, at the north-eastern edge of Doncaster, four galls were found on oaks by the lake. Later that day, further galls were recorded on oaks growing in fairly open spaces in Sandall Beat Wood by Doncaster Racecourse SE6103, near to the children's play area.

Gall wasps on oak have two generations, the sexual and the agamic. Different generations of the more common cynipids usually gall different parts of the same host of Pedunculate Oak or Sessile Oak *Q. petraea*. The sexual generation of the Common Spangle *Neuroterus quercusbaccarum* galls the male catkins and occasionally the leaves in spring forming the Currant Gall, but the agamic generation in late summer forms golden discs on the underside of the leaves. However, *Andricus gemmeus* belongs to a group of cynipids with heteroecious life cycles. *A. quercuscalicis*, the Knopper Gall on the acorn, is one of the most common examples of this life cycle, where the different generations develop on different species of

oak. The sexual generation of the Knopper Gall forms on the catkins of Turkey Oak *Quercus cerris* while the agamic generation forms the striking galls on the acorns of Pedunculate Oak and occasionally Sessile Oak. *A. gemmeus* is a further example of this fascinating life cycle, which, because the sexual generation occurs on buds on the branches and trunks of Turkey Oak, has so far not been recorded in Britain.

A plant gall meeting at the RSPB Reserve at Old Moor in early September led to the discovery of yet another unusual gall causer. Margaret Redfern examined a small purplish swelling on a stem of Creeping Bent *Agrostis stolonifera*. After further research she identified the causer as the nematode *Subanguina graminophila* (see Plate III, centre pages). Later in October Ian Farmer recorded another interesting gall in Sandall Park, when he found some old specimens of the Ram's Horn Gall *Andricus aries* on the buds of Pedunculate Oak (see Plate III, centre pages). This was the second Yorkshire record; Bill Ely had discovered the first specimens on Hatfield Moor in 2011.

References

Bowdrey, J. (2009) *Andricus gemmeus* (Giraud 1859) A Gall Wasp (Hymenoptera: Cynipidae) New to the British Isles. *Cecidology* 24 (1), 34-38.

Chinery, M. (2011) *Britain's Plant Galls: A photographic guide*. WILDGuides, New Jersey.

Redfern, M., Shirley, P. & Bloxham, M. (2011) *British Plant Galls*. Field Studies Council, Preston Montfort.

Redfern, M. (2011) *Plant Galls*. New Naturalist Library, HarperCollins, London.

A provisional Vascular Plant Red Data List for VC63 - an evaluation of current status

G.T.D. Wilmore
email: consultecol.wilmore@btinternet.com

Introduction

The first reference to Rare and Scarce Plants Documentation in VC63 formed the subject of a paper I submitted to BSBI News (Wilmore, 1997). Unfortunately, the content and rationale of this paper was not followed up and implemented at the time, because it was overtaken and submerged by pressures of my ongoing ecological consultancy work and, importantly, by the completion of my work on introduced plant species in Yorkshire (Wilmore, 2000), followed by the initiation of work on the production of *The South Yorkshire Plant Atlas* (Wilmore *et al.*, 2011). The Atlas proved to be a major project occupying, essentially, ten years from 2001 to 2011. During those ten years the desideratum of a Red Data Plant List for VC63 lay dormant.

Only now, in 2012, has it been possible to turn attention once more to the consideration of forming some provisional ideas on the presentation of a Red Data list for S.W. Yorkshire. I stress that this paper is, at this stage, discussing and presenting provisional information only. The appearance of *The South Yorkshire Plant Atlas* (*op.cit.*), containing comprehensive data totalling over 200,000 individual records and describing over 2000 vascular plants, has been an enormous help in informing the determination and evaluation of RDB species in VC63. However, other factors have also become important. The former national authorities on Rare and Scarce Plant Species (Perring & Farrell, 1977, 1983; Stewart *et al.* 1994; Wigginton, 1999) have been superseded since 1997 by the current authority (Cheffings & Farrell, 2005).

Furthermore, the authors of the *New Atlas of the British and Irish Flora* (Preston *et al.*, 2002), considered that it was important to separate native from introduced species and, in doing so, carried out a reassessment of the total British and Irish flora. Three new terms appeared for Introduced (or Alien) species - **Archaeophytes** (those which became naturalised before 1500 AD); **Neophytes** (ones introduced after 1500 AD) and **Casuals** (plants unable to persist for more than *c.*5 years and are therefore dependent on constant reintroduction). These three terms became the norm for evaluating all introduced plants and the authors of the new Red Data List (*op.cit.*) chose to include a number of scarce Archaeophytes based on three reasons: 1) an evidence of some decline and the need for conservation action, 2) the lack of a known 'native' distribution and 3) because of their cultural and historic importance i.e. their relationship with humans and our activities. In essence, most of these rare Archaeophytes are arable weeds; this category of introductions will be discussed below in further detail, in relation to its status in VC63.

A further important development incorporated in Cheffings & Farrell (2005) was the adoption of the commitment made in 'Plant Diversity Challenge: The UK's response to the Global Strategy for Plant Conservation' (JNCC, 2004), whereby all UK vascular plants are assessed using IUCN (International Union for the Conservation of Nature and Natural Resources – now the World Conservation Union (WCU)) criteria. In this regard, six IUCN categories of nature conservation concern can be highlighted: **Extinct (EX); Extinct in the Wild (EW)** (i.e. surviving only in captivity); **Critically Endangered (CR); Endangered (EN); Vulnerable (VU); Near Threatened (NT)**. Three further categories are listed which are not considered to be of nature conservation concern: **Least Concern (LC), Data Deficient (DD)** where insufficient data exist to allow a definite assessment of risk to be made and **Not Evaluated (NE)** where no evaluation has been made against the IUCN criteria. A mention should also be made of the **Waiting List (WL)** – this category was adopted to cater for taxa for which there were either insufficient data, taxonomic uncertainty or uncertainly over native, Archaeophyte or Neophyte status, and plants occasionally fall into this category in the lists below. Finally, one or two taxa are shown in the **Parking List (PL)**, a further category where insufficient data are present to assign them to other categories or where there is evidence that they are Neophytes.

The compilation of the Provisional Vascular Plant Red Data list for VC63 has been undertaken utilising six separate categories to accommodate all taxa under consideration. These are: **1) Native Species; 2)Native Species Presumed Extinct in the VC; 3)Hybrids; 4)Archaeophytes; 5) Grey Area Species – Native or Introduced; 6)Unconfirmed Species**. Tabulated lists are given below covering each of these categories and associated information includes **a)UK status** (i.e. abundant, frequent, rare, etc. - based on mapped or other evidence given in Preston *et al.* (2002)); **b)VC63 status** (based on data collected during the past 40 years and/or on personal observation/evidence); **c)the IUCN Threat/Non-Threat Category** (as given in Cheffings & Farrell (2005). The checklist order follows Stace (2010) in all six categories. Species which have the symbols * ? shown in the IUCN Threat/Non Threat column are those which seem, to the author, to have a somewhat anomalous National Threat Category designation.

As stated above, this paper is not a definitive Red Data List for Vascular Plants in VC63. It opens the door to invite and encourage botanists in the region to participate in the more detailed fieldwork which is required to achieve this. At the same time, the information below, presented in a new and slightly different format, provides a factual, realistic and far more comprehensive assessment than ever before achieved on the current status of rare, scarce or at-risk plant species in S.W. Yorkshire.

The Provisional Red Data Plant List for VC63

1) Native Species

This list contains all those eligible plants which are Native in some parts of Great Britain and Ireland (Preston *et al.*, 2002) even though they may not necessarily be native in VC63 and for which there is reasonable current evidence that extant populations are present in the vice county. The critical taxa included in the genera *Rubus* (brambles), *Hieracium* (hawkweeds) and *Taraxacum* (dandelions) have been omitted, as it is felt that insufficient data exist at the moment to enable a worthwhile assessment to be made on these groups throughout the vice county.

Species	UK Status (Preston *et al.*, 2002)	VC63 Status – Native, unless otherwise stated	IUCN Threat/Non Threat
Huperzia selago	Locally frequent	Very Rare	LC
Lycopodium clavatum	Locally frequent	Rare	LC
Selaginella selaginoides	Locally frequent	Very Rare	LC
Equisetum hyemale	Scattered	Very Rare	LC
Trichomanes speciosum (sporophyte)	Very Rare	Very Rare	LC *?
Pilularia globulifera	Rare	Very Rare	NT
Thelypteris palustris	Rare	Very Rare	LC
Dryopteris cambrensis	Unquantified	Rare	Not listed
Polypodium interjectum	Locally abundant	Rare	LC
Fumaria capreolata ssp. *babingtonii*	Widespread	Casual only - Rare	LC
Fumaria muralis	Widespread	Occasional	LC
Trollius europaeus	Locally frequent	Very Rare	LC
Ranunculus sardous	Locally frequent	Rare	LC
Ranunculus baudotii	Locally frequent	Very Rare	LC
Ranunculus circinatus	Locally frequent	Very Rare	LC
Ribes alpinum	Locally frequent	Introduced - Rare	LC
Saxifraga granulata	Widespread	Introduced – Rare	LC
Chrysosplenium alternifolium	Locally abundant	Very Rare	LC
Myriophyllum verticillatum	Locally frequent	Rare	VU
Myriophyllum alterniflorum	Locally abundant	Very Rare	LC
Astragalus danicus	Locally frequent	Very Rare	EN
Onobrychis viciifolia	Locally frequent	Casual only - Scattered	NT
Lotus subbiflorus	Local	Casual only – Very Rare	LC *?
Hippocrepis comosa	Locally frequent	Rare	LC
Vicia sylvatica	Widespread	Rare	LC
Vicia lathyroides	Locally frequent	Rare	LC
Vicia lutea	Rare	Casual only – Very Rare	NT
Vicia bithynica	Rare	Casual only – Very Rare	VU
Lathyrus palustris	Very Rare	Very Rare	NT
Lathyrus nissolia	Locally abundant	Rare	LC
Lathyrus aphaca	Local, scattered	Casual only – Very Rare	VU
Ononis spinosa	Locally frequent	Very Rare	LC
Medicago sativa ssp. *varia*	Local	Casual only – Very Rare	Not listed
Medicago minima	Local	Casual only – Rare	VU
Genista pilosa	Rare	Casual only – Very Rare	NT
Genista anglica	Locally frequent	Rare	NT
Ulex minor	Locally frequent	Rare	LC
Filipendula vulgaris	Locally abundant	Scarce	LC
Rubus saxatilis	Locally abundant	Very Rare	LC
Potentilla fruticosa	Very Rare	Casual only – Rare	NT
Potentilla argentea	Locally frequent	Very Rare	NT
Potentilla tabernaemontani	Scattered	Rare	LC
Potentilla erecta ssp. *strictissima*	Local	Very Rare	LC
Agrimonia procera	Widespread	Very Rare	LC
Aphanes australis	Widespread	Occasional	LC

Species	UK Status (Preston *et al.*, 2002)	VC63 Status – Native, unless otherwise stated	IUCN Threat/Non Threat
Rosa obtusifolia	Scattered	Rare	LC
Rosa tomentosa	Locally frequent	Rare	LC
Rosa sherardii	Widespread	Rare	LC
Rosa rubiginosa	Widespread	Occasional	LC
Ulmus minor ssp. *angustifolia*	Not listed	Introduced – Rare	PL
Ulmus plotii	Scattered	Introduced – Rare	PL
Myrica gale	Locally abundant	Local	LC
Betula pubescens ssp. *tortuosa*	Not listed	Introduced – Rare	WL
Parnassia palustris	Locally abundant	Rare	LC
Euphorbia stricta	Very local	Casual only – Rare	LC *?
Salix caprea ssp. *sphacelata*	Rare	Rare	LC
Salix phylicifolia	Locally frequent	Rare	LC
Salix repens	Widespread	Scattered	LC
Viola hirta ssp. *calcarea*	Not listed	Rare	Not listed
Viola canina ssp. *canina*	Widespread	No modern records	NT
Viola tricolor ssp. *tricolor*	Widespread	Scattered	NT
Linum bienne	Locally frequent	Casual only – Rare	LC
Linum perenne	Rare	Casual only – Rare	LC *?
Hypericum montanum	Scattered	Scattered	NT
Geranium rotundifolium	Locally abundant	Casual only – Rare	LC
Geranium columbinum	Locally abundant	Rare	LC
Epilobium lanceolatum	Locally frequent	Rare	LC
Epilobium tetragonum ssp.*lamyi*	Locally abundant	Casual only – Rare	LC
Epilobium anagallidifolium	Locally frequent	Very Rare	LC
Althaea officinalis	Locally frequent	Casual only – Very Rare	LC
Daphne mezereum	Rare	Introduced – Rare	VU
Turritis glabra	Rare	Casual only – Very Rare	EN
Rorippa islandica	Rare	Casual only – Very Rare	LC *?
Erophila glabrescens	Scattered	Very Rare	LC
Teesdalia nudicaulis	Scattered	Rare	NT
Iberis amara	Local	Casual only – Very Rare	VU
Viscum album	Locally abundant	Occasional	LC
Rumex longifolius	Locally abundant	Rare	LC
Rumex palustris	Locally frequent	Rare	LC
Rumex maritimus	Locally frequent	Rare	LC
Arenaria leptoclados	Locally abundant	Rare	LC
Stellaria pallida	Locally frequent	Rare	LC
Stellaria neglecta	Locally abundant	Occasional	LC
Stellaria palustris	Locally frequent	Occasional	VU
Sagina maritima	Locally frequent	Casual only – Very Rare	LC
Scleranthus annuus ssp. *annuus*	Locally frequent	Occasional	EN
Dianthus deltoides	Scattered	Casual only -Rare	NT
Impatiens noli-tangere	Rare	Very Rare	LC
Anagallis tenella	Widespread	Scattered	LC
Samolus valerandi	Widespread	Occasional	LC
Arctostaphylos uva-ursi	Locally frequent	Rare	LC
Andromeda polifolia	Locally frequent	Occasional	LC
Pyrola rotundifolia ssp. *rotundifolia*	Rare	Very Rare	NT
Hypopitys monotropa	Scattered	Rare	EN
Asperula cynanchica	Locally frequent	Rare	LC
Galium uliginosum	Widespread	Occasional	LC
Gentianella amarella ssp. *amarella*	Widespread	Scattered	LC
Lithospermum purpureocaeruleum	Rare	Casual only – Very Rare	LC
Symphytum tuberosum	Locally frequent	Casual only – Very Rare	WL
Myosotis stolonifera	Locally frequent	Very Rare	LC
Cynoglossum officinale	Locally frequent	Very Rare	NT
Atropa belladonna	Widespread	Occasional	LC

Species	UK Status (Preston *et al.*, 2002)	VC63 Status – Native, unless otherwise stated	IUCN Threat/Non Threat
Veronica scutellata	Widespread	Occasional	LC
Veronica anagallis-aquatica	Locally abundant	Occasional	LC
Callitriche hermaphroditica	Scattered	Very Rare	LC
Verbascum nigrum	Locally abundant	Casual only – Rare	LC
Verbascum pulverulentum	Local	Casual only – Very Rare	LC
Scrophularia umbrosa	Scattered	Very Rare	LC
Limosella aquatica	Scattered	Very Rare	LC
Marrubium vulgare	Scattered	Casual only – Very Rare	LC
Scutellaria minor	Locally frequent	Rare	LC
Clinopodium ascendens	Locally frequent	Very Rare	LC
Clinopodium calamintha	Local	Casual only – Very Rare	VU
Clinopodium acinos	Locally frequent	Very Rare	VU
Thymus pulegioides	Locally frequent	Very Rare	LC
Mentha pulegium	Rare	Casual only – Very Rare	EN
Salvia verbenaca	Locally frequent	Very Rare	LC
Euphrasia nemorosa	Widespread	Occasional	LC
Euphrasia pseudokerneri	Locally frequent	Very Rare	EN
Odontites vernus ssp. *serotinus*	Not listed	Rare	LC
Parentucellia viscosa	Locally frequent	Casual only – Very Rare	LC
Rhinanthus angustifolius	Very Rare	Very Rare	WL
Rhinanthus minor ssp. *stenophyllus*	Scattered	Rare	WL
Pedicularis palustris	Locally abundant	Very Rare	LC
Orobanche hederae	Scattered	Casual only – Very Rare	LC
Orobanche minor	Locally frequent	Very Rare	LC
Pinguicula vulgaris	Locally abundant	Occasional	LC
Utricularia vulgaris	Scattered	Very Rare	LC
Utricularia australis	Scattered	Very Rare	LC
Campanula patula	Local	Casual only – Very Rare	EN
Campanula trachelium	Locally abundant	Occasional	LC
Wahlenbergia hederacea	Locally frequent	Very Rare	NT
Jasione montana	Locally abundant	Rare	LC
Carlina vulgaris	Locally abundant	Occasional	LC
Cirsium eriophorum	Locally frequent	Rare	LC
Cirsium dissectum	Locally frequent	Rare	LC
Cirsium acaule	Locally abundant	Rare	LC
Serratula tinctoria	Locally frequent	Very Rare	LC
Hypochaeris glabra	Local	Casual only –Very Rare	VU
Sonchus palustris	Rare	Introduced – Very Rare	LC *?
Filago vulgaris	Locally frequent	Scattered	NT
Gnaphalium sylvaticum	Locally frequent	Local	EN
Aster tripolium	Locally frequent	Casual only – Very Rare	LC
Aster linosyris	Very rare	Casual only – Very Rare	LC *?
Chamaemelum nobile	Locally frequent	Casual only – Very Rare	VU
Tripleurospermum maritimum	Locally frequent	Casual only – Very Rare	LC
Valerianella locusta	Locally frequent	Rare	LC
Dipsacus pilosus	Locally frequent	Rare	LC
Scabiosa columbaria	Locally abundant	Scattered	LC
Anthriscus caucalis	Locally frequent	Scattered	LC
Oenanthe fistulosa	Locally frequent	Occasional	VU
Oenanthe lachenalii	Locally frequent	Rare	LC
Oenanthe aquatica	Locally frequent	Occasional	LC
Apium graveolens	Locally frequent	Very Rare	LC
Apium inundatum	Widespread	Very Rare	LC
Sison amomum	Locally abundant	Rare	LC
Spirodela polyrhiza	Scattered	Scarce	LC
Baldellia ranunculoides	Scattered	Very Rare	NT
Luronium natans	Locally frequent	Rare	LC *?

Species	UK Status (Preston *et al.*, 2002)	VC63 Status – Native, unless otherwise stated	IUCN Threat/Non Threat
Alisma lanceolatum	Locally frequent	Occasional	LC
Hydrocharis morsus-ranae	Locally frequent	Occasional	VU
Stratiotes aloides	Rare	Introduced – Rare	NT
Potamogeton coloratus	Locally frequent	Very Rare	LC
Potamogeton epihydrus	Very Rare	Rare	VU
Potamogeton obtusifolius	Locally frequent	Very Rare	LC
Potamogeton trichoides	Scattered	Very Rare	LC
Paris quadrifolia	Locally frequent	Very Rare	LC
Colchicum autumnale	Locally frequent	Casual only – Very Rare	NT
Gagea lutea	Scattered	Occasional	LC
Epipactis palustris	Scattered	Very Rare	LC
Epipactis phyllanthes	Scattered	Very Rare	LC
Neottia nidus-avis	Scattered	Very Rare	NT
Spiranthes spiralis	Locally frequent	Very Rare	NT
Platanthera chlorantha	Locally frequent	Very Rare	NT
Gymnadenia conopsea	Locally frequent	Very Rare	LC
Dactylorhiza incarnata ssp. *coccinea*	Rare	Very Rare	WL
Anacamptis pyramidalis	Locally frequent	Occasional	LC
Anacamptis morio	Locally frequent	Very Rare	NT
Himantoglossum hircinum	Rare	Very Rare	NT
Ophrys insectifera	Scattered	Rare	VU
Sisyrinchium bermudiana	Rare	Casual only – Very Rare	Not listed
Iris foetidissima	Locally abundant	Casual only – Very Rare	LC
Allium schoenoprasum	Rare	Casual only – Very Rare	LC *?
Allium oleraceum	Locally frequent	Scattered	VU
Allium scorodoprasum	Locally frequent	Casual only – Very Rare	LC
Allium vineale	Locally abundant	Very Rare	LC
Leucojum aestivum	Rare	Casual only – Very Rare	LC *?
Narcissus pseudonarcissus	Locally frequent	Rare	LC
Convallaria majalis	Scattered	Introd. & Native - Occasional	LC
Muscari neglectum	Rare	Casual only – Very Rare	VU
Ruscus aculeatus	Locally frequent	Casual only – Rare	LC
Sparganium erectum ssp. *oocarpum*	Not listed	Very Rare	WL
Juncus compressus	Scattered	Occasional	NT
Juncus gerardii	Locally frequent	Casual only – Rare	LC
Juncus ranarius	Scattered	Casual only – Very Rare	LC
Eriophorum latifolium	Locally frequent	Very Rare	LC
Bolboschoenus maritimus	Locally frequent	Introduced – Very Rare	LC
Scirpus sylvaticus	Widespread	Rare	LC
Eleocharis uniglumis	Locally frequent	Very Rare	LC
Eleocharis acicularis	Scattered	Occasional	LC
Eleogiton fluitans	Locally frequent	Rare	LC
Cyperus longus	Rare	Casual only – Rare	NT
Cladium mariscus	Locally frequent	Rare	LC
Carex vulpina	Very Rare	Very Rare	VU
Carex muricata ssp. *pairae*	Locally abundant	Rare	LC
Carex arenaria	Locally abundant	Rare	LC
Carex dioica	Locally frequent	Rare	LC
Carex strigosa	Locally frequent	Very Rare	LC
Carex hostiana	Locally abundant	Rare	LC
Carex lepidocarpa	Locally abundant	Rare	LC
Carex pallescens	Widespread	Occasional	LC
Carex digitata	Scarce	Rare	LC *?
Carex ericetorum	Scarce	Rare	VU
Carex acuta	Widespread	Occasional	LC
Carex elata	Locally frequent	Occasional	LC

Species	UK Status (Preston *et al.*, 2002)	VC63 Status – Native, unless otherwise stated	IUCN Threat/Non Threat
Festuca altissima	Scattered	Very Rare	LC
Festuca rubra ssp. *litoralis*	Scattered	Casual only – Very Rare	LC
Festuca ovina ssp. *hirtula*	Not listed	Very Rare	WL
Festuca ovina ssp. *ophioliticola*	Not listed	Very Rare	WL
Festuca filiformis	Widespread	Rare	LC
Festuca longifolia	Very Rare	Casual only – Very Rare	LC *?
Vulpia ciliata ssp. *ambigua*	Locally frequent	Very Rare	LC
Poa infirma	Local	Casual only – Very Rare	LC
Poa humilis	Widespread	Rare	LC
Catabrosa aquatica	Widespread	Very Rare	LC
Catapodium marinum	Locally frequent	Casual only – Very Rare	LC
Koeleria macrantha	Widespread	Occasional	LC
Polypogon monspeliensis	Local	Casual only – Very Rare	LC
Alopecurus aequalis	Scattered	Rare	LC
Phleum arenarium	Scattered	Casual only – Very Rare	LC
Melica nutans	Locally frequent	Occasional	LC
Bromus commutatus	Locally abundant	Occasional	LC
Bromus racemosus	Locally frequent	Rare	LC
Bromus hordeaceus ssp. *longipedicellatus*	Not listed	Very Rare	WL
Bromopsis benekenii	Rare	Very Rare	LC *?
Hordeum secalinum	Locally abundant	Occasional	LC
Molinia caerulea ssp. *arundinacea*	Scattered	Occasional	LC

2) Native species presumed Extinct in the Vice County

This section lists those plants for which no records have been received for around 20 years and which may now be presumed to be extinct in VC63. A number of them are almost certainly casuals which may come and go intermittently over time, but this list essentially highlights those which will repay further investigation to either overturn or confirm their present extinct status. Where known, the date(s) and details of last verified occurrence are given. (C) shown after the species name denotes where it is suggested/assumed that the species was only a casual in VC63, although no absolute definitive proof can be ascertained with older historical records.

Species	UK Status (Preston et al, 2002)	Dates/details of last verified occurrence, where known	IUCN Threat/Non Threat
Lycopodiella inundata	Rare	Thorne Moors, 1970	EN
Diphasiastrum alpinum	Locally frequent	Lees (1888)	LC
Hymenophyllum tunbrigense	Locally frequent	Nr. Todmorden, 1837	LC
Hymenophyllum wilsonii	Locally frequent	Lees (1888)	NT
Cryptogramma crispa	Locally frequent	Knotts Wood, 1862	LC
Asplenium obovatum	Locally frequent	Lees (1888)	NT
Asplenium viride	Locally frequent	Lees (1888)	LC
Gymnocarpium robertianum	Locally frequent	Lees (1888)	LC
Dryopteris aemula	Locally frequent	Luddendenfoot, 1862	LC
Dryopteris submontana	Rare	Sprotboro' 1981 ?	LC
Dryopteris cristata	Very Rare	Thorne Waste, 1871	CR
Fumaria bastardii (C)	Locally frequent	Campsall C.Park, 1977	LC
Pulsatilla vulgaris	Rare	Went Vale, 1870	VU
Ranunculus parviflorus	Locally frequent	Hatfield Moor, 1970	LC
Myosurus minimus	Locally frequent	unconfirmed	VU
Lotus tenuis	Locally frequent	Lindrick Dale, 1966	LC
Rosa stylosa	Locally frequent	Levitt Hagg, 1871	LC
Rosa micrantha	Locally frequent	Roche Abbey, 1838	LC

Species	UK Status (Preston et al, 2002)	Dates/details of last verified occurrence, where known	IUCN Threat/Non Threat
Viola lactea	Locally frequent	Thorne Moors, 1970	VU
Viola persicifolia	Rare	Thorne Moors, 1981	EN
Viola lutea	Locally frequent	Murgatroyd (1995)	LC
Radiola linoides	Scattered	Miller (1804)	NT
Hypericum elodes	Locally frequent	Loxley Valley, 1985	LC
Lythrum hyssopifolia (C)	Rare	Lees (1888)	EN
Circaea alpina	Rare	Lees (1888)	LC
Cardamine impatiens	Scattered	Scabba Wood, 1981	NT
Matthiola sinuata (C)	Very Rare	Anston Stones, 1986	VU
Persicaria mitis (C)	Scattered	Bentley Common, 1973	VU
Fallopia dumetorum (C)	Local	Thorpe Salvin, 1988	VU
Rumex pulcher (C)	Locally frequent	Denaby Ings, 1969	LC
Drosera anglica	Locally frequent	Lees (1888)	NT
Drosera intermedia	Locally frequent	Thorne Moors, 1976	LC
Minuartia verna	Locally frequent	Levitt Hagg, 1992	NT
Minuartia hybrida	Scattered	Shaftholme Junct, 1993	EN
Moenchia erecta (C)	Locally frequent	Lees (1888)	LC
Corrigiola litoralis (C)	Very Rare	Manvers tip, 1993	CR
Herniaria glabra (C)	Very Rare	Wombwell, 1993	LC
Illecebrum verticillatum (C)	Very Rare	Brodsw'th Colliery, 1987	EN
Polycarpon tetraphyllum (C)	Very Rare	Wentworth, 1803	LC
Silene conica (C)	Rare	Huddersfield, 1873	VU
Petrorhagia nanteuilii (C)	Very Rare	Thorne area, 1947	VU
Lysimachia thyrsiflora	Local	Kelham Island, 1988	LC
Trientalis europaea	Locally frequent	Soil Hill, Halifax, 1874	LC
Centunculus minimus	Locally frequent	Maltby Woods, 1840s	NT
Pyrola minor	Locally frequent	Maltby Woods, 1888	LC
Pyrola media	Locally frequent	Ray Gate, Halifax, 1980s	VU
Galium constrictum	Rare	Shirley Pool, 1987	LC
Centaurium pulchellum (C)	Locally frequent	Lees (1888)	LC
Gentianella campestris	Locally frequent	Maltby Common, 1962	VU
Gentiana pneumonanthe	Rare	Hatfield/Lindholme,1887	LC *?
Cuscuta europaea	Scattered	Wheatley Wood, 1920	LC *?
Cuscuta epithymum	Locally frequent	Lees (1888)	VU
Callitriche truncata	Local	Hatfield/Lindholme,1980	LC *?
Callitriche obtusangula	Widespread	Hatfield Moor, 1976	LC
Teucrium scordium (C)	Very Rare	Miller (1804)	EN
Salvia pratensis (C)	Rare	Brightside,Sheffield,1911	NT
Orobanche rapum-genistae	Scattered	Calderdale, 1850s	NT
Utricularia minor	Locally frequent	Wath Wood, 1983	LC
Carduus tenuiflorus (C)	Locally frequent	East Ardsley, 1981	LC
Cirsium heterophyllum	Locally frequent	Sandbeck Park, 1974	LC
Filago lutescens	Rare	Lees (1888)	EN
Antennaria dioica	Locally abundant	Lindrick Common, 1947	LC
Senecio paludosus	Very Rare	Rushy Moor, 1976 ?	CR
Tephroseris palustris	Extinct	Rossington, 1785	EX
Sium latifolium	Locally frequent	Went Valley, pre-1980	EN
Oenanthe pimpinelloides	Locally frequent	Doncaster Carr, 1974	LC
Oenanthe fluviatilis	Scattered	Fishlake, 1946	LC
Meum athamanticum	Local	Warley, Halifax, 1775	NT
Petroselinum segetum	Locally frequent	Pontefract, 1865	LC
Peucedanum palustre	Local	Rochdale Canal, 1970s	VU
Torilis nodosa (C)	Locally frequent	Bradford, 1991	LC
Scheuchzeria palustris	Very Rare	Thorne Moors, 1870s	LC *?
Potamogeton lucens	Locally frequent	Hatfield Moor, 1976	LC
Potamogeton gramineus	Scattered	Thorne Dikes 1880s	LC
Potamogeton alpinus	Locally frequent	Drain,Hatfield Moor,1980	LC

Species	UK Status (Preston et al, 2002)	Dates/details of last verified occurrence, where known	IUCN Threat/Non Threat
Potamogeton praelongus	Scattered	Hatfield Moor, 1975	NT
Potamogeton friesii	Scattered	Chesterfield Canal, 1991	NT
Potamogeton compressus	Scattered	Sheffield Canal, 1979	EN
Groenlandia densa	Locally frequent	Thorpe Marsh NR, 1985	VU
Epipactis purpurata	Locally frequent	Ecclesall Wood, 1670	LC
Neottia cordata	Locally frequent	Lees (1888)	LC
Platanthera bifolia	Scattered	Armthorpe, 1981	VU
Pseudorchis albida	Scattered	Todmorden area, C19th	VU
Gymnadenia densiflora	Rare	Lindrick Dale, 1991	DD
Coeloglossum viride	Scattered	Cragg Vale, 1980s	VU
Dactylorhiza incarnata ssp. *incarnata*	Scattered	Thwaite House, 1975	LC
Dactylorhiza traunsteinerioides	Scattered	Thorne Moors, 1989	LC
Neotinea ustulata	Scattered	Kirk Smeaton, 1976	EN
Allium sphaerocephalon (C)	Very Rare	East Ardsley, 1991	VU
Sparganium angustifolium	Locally abundant	Doncaster Carr, 1796	LC
Sparganium natans	Locally frequent	Herb. Salt 1800	LC
Eleocharis multicaulis	Locally frequent	Thorpe Marsh, 1982	LC
Eleocharis quinqueflora	Locally frequent	Sheffield Moors, 1801	LC
Blysmus compressus	Locally frequent	Shireoaks Marsh, 1975	VU
Schoenus nigricans	Locally frequent	Rushy Moor, 1900	LC
Rhynchospora alba	Locally frequent	Lees (1888)	LC
Carex diandra	Locally frequent	Adwick-le-Street, 1850	NT
Carex divulsa ssp. *leersii*	Locally frequent	Wagon La,Bingley, 1976	LC
Carex divisa	Locally frequent	Goole 1880 ?	VU
Carex elongata	Rare	Fishlake area, 1946	LC *?
Carex distans	Locally frequent	Maltby Valley, 1989	LC
Carex oederi	Locally frequent	Nr. Maltby, 1948	LC
Carex limosa	Locally frequent	Thorne Moors, c. 1870	LC
Parapholis strigosa (C)	Locally frequent	Dewsbury tip, 1960	LC
Deschampsia setacea	Local	Lees (1888)	LC
Calamagrostis stricta	Rare	Thorne Moors, 1970	VU
Gastridium ventricosum (C)	Rare	Kirk Smeaton, 1976	LC *?
Leymus arenarius (C)	Locally frequent	Siddal,Halifax, 1980s	LC

3) Hybrids

This is a difficult category to quantify and assess. Hybrids are produced in many common and widespread genera, e.g. *Salix* (willows), *Rosa* (roses), *Epilobium* (willowherbs), and *Rumex* (docks), but such hybrids are very often, in fact almost exclusively, the province of the specialist and tend to be shunned, overlooked or not catered for by the general botanist. Sometimes, hybrids are collected by non-specialists and sent to referees for identification or verification, but such instances are quite rare. The result is that we have, certainly in VC63 and, I feel, fairly generally throughout the country, a very incomplete and sporadic picture of the distribution of hybrids across the board. In terms of the table below, the VC63 Status column will often be 'Very Rare', 'Rare' or 'Scarce'. I would stress that this is only a very provisional assessment but the best that we have at the moment. Much more work needs to be done on the accurate recording of hybrids generally, to produce anything like a meaningful distribution pattern. It will also be noticed that many hybrids are not listed in Preston *et al.* (2002), so no UK status can be ascertained, while Cheffings & Farrell (2005), do not seem to cater for very many hybrids at all (at least of those which occur in the VC63 list).

In the table below, the statement 'No Modern Records' under VC63 Status indicates that there is no inclination to suggest that any hybrid is extinct – this would be unrealistic, as there is always the possibility of hybrids occurring where one or both parents exist.

Species	UK Status (Preston *et al.*, 2002)	VC63 Status – Native, unless otherwise stated	IUCN Threat/ Non Threat
Equisetum x litorale	Locally frequent	Rare	Not listed
Polystichum x bicknellii	Rare	Very Rare	Not listed
Dryopteris x complexa	Rare	Rare	Not listed
Dryopteris x deweveri	Scattered	Rare	Not listed
Prunus x fruticans	Scattered	Very Rare	Not listed
Sorbus x thuringiaca	Not listed	Planted – Very Rare	Not listed
Potentilla x suberecta	Locally frequent	Very Rare	Not listed
Geum x intermedium	Locally abundant	Rare	Not listed
Rosa x irregularis	Locally frequent	No Modern Records	Not listed
Rosa x andrzejowski	Not listed	No Modern Records	Not listed
Rosa x involuta	Very Rare	No Modern Records	Not listed
Rosa x dumalis	Widespread	Scattered	Not listed
Rosa x dumetorum	Locally frequent	Rare	Not listed
Rosa x rothschildii	Scattered	Very Rare	Not listed
Rosa x molletorum	Not listed	Rare	Not listed
Rosa x nitidula	Scattered	Rare	Not listed
Ulmus x vegeta	Locally frequent	Rare	Not listed
Ulmus x hollandica	Scattered	Rare	Not listed
Salix x smithiana	Widespread	Scattered	Not listed
Salix x stipularis	Rare	No Modern Records	Not listed
Salix x holosericea	Widespread	Rare	Not listed
Salix x capreola	Scattered	Rare	Not listed
Salix x multinervis	Widespread	Scarce	Not listed
Salix x laurina	Scattered	Rare	Not listed
Viola x scabra	Rare	Rare	Not listed
Viola x bavarica	Scattered	Very Rare	Not listed
Viola x ritschliana	Not listed	No Modern Records	Not listed
Viola x contempta	Scattered	Very Rare	Not listed
Epilobium x subhirsutum	Not listed	Rare	Not listed
Epilobium x erroneum	Not listed	Rare	Not listed
Epilobium x limosum	Rare	Rare	Not listed
Epilobium x rivulare	Not listed	Very Rare	Not listed
Epilobium x haussknechtianum	Not listed	Very Rare	Not listed
Epilobium x aggregatum	Rare	Very Rare	Not listed
Epilobium x heterocaule	Not listed	Very Rare	Not listed
Circaea x intermedia	Locally frequent	No Modern Records	Not listed
Nasturtium x sterile	Widespread	Occasional	Not listed
Rumex x propinquus	Rare	Rare	Not listed
Rumex x hybridus	Scattered	Rare	Not listed
Rumex x weberi	Not listed	Very Rare	Not listed
Rumex x schulzei	Not listed	Very Rare	Not listed
Rumex x ruhmeri	Not listed	Very Rare	Not listed
Rumex x abortivus	Not listed	Very Rare	Not listed
Rumex x dufftii	Scattered	Very Rare	Not listed
Drosera x obovata	Rare	No Modern Records	Not listed
Cerastium arvense x tomentosum	Not listed	Very Rare	Not listed
Cerastium x pseudoalpinum	Not listed	Very Rare	Not listed
Vaccinium x intermedium	Not listed	Occasional	Not listed
Galium x pomeranicum	Scattered	Very Rare	Not listed
Myosotis x suzae	Not listed	Very Rare	Not listed
Veronica x lackschewitzii	Local	Very Rare	Not listed
Linaria x sepium	Scattered	Very Rare	Not listed
Mentha x gracilis	Widespread	Occasional	Not listed
Mentha x piperita	Widespread	Occasional	Not listed
Carduus x stangii	Rare	No Modern Records	Not listed
Cirsium x celakovskianum	Not listed	Very Rare	Not listed
Centaurea x gerstlaueri	Not listed	Very Rare	Not listed
Senecio x baxteri	Rare	Very Rare	Not listed

Species	UK Status (Preston *et al.*, 2002)	VC63 Status – Native, unless otherwise stated	IUCN Threat/ Non Threat
Potamogeton x angustifolius	Scattered	No Modern Records	Not listed
Potamogeton x nitens	Scattered	No Modern Records	Not listed
Platanthera x hybrida	Not listed	No Modern Records	Not listed
Dactylorhiza x transiens	Rare	Very Rare	Not listed
D. fuchsii x D. incarnata ssp. *coccinea*	Not listed	Very Rare	Not listed
Dactylorhiza x venusta	Scattered	Rare	Not listed
Dactylorhiza x insignis	Not listed	Very Rare	Not listed
Typha x glauca	Scattered	Very Rare	Not listed
Juncus x surrejanus	Scattered	Very Rare	Not listed
Juncus x diffusus	Scattered	Very Rare	Not listed
Juncus x kern-reichgeltii	Not listed	Very Rare	Not listed
Carex x boenninghausiana	Rare	No Modern Records	Not listed
Carex x pseudoaxillaris	Scattered	Very Rare	Not listed
Carex x fulva	Locally frequent	No Modern Records	Not listed
X Schedolium loliaceum	Locally frequent	Occasional	Not listed
Festuca rubra x Vulpia myuros	Not listed	Very Rare	Not listed
Holcus x hybridus	Not listed	Very Rare	Not listed
Agrostis x murbeckii	Not listed	Very Rare	Not listed
X Agropogon luteus	Not listed	Very Rare	Not listed
Calamagrostis x gracilescens	Not listed	No Modern Records	VU
Alopecurus x brachystylus	Scattered	Very Rare	Not listed
Glyceria x pedicellata	Widespread	Very Rare	Not listed

4) Archaeophytes

The rationale governing the inclusion of rare Archaeophytes in the Great Britain Red Data List (*loc.cit.*) has been given above. In terms of the occurrence of the selection of rare (RDB) Archaeophytes in VC63 given below, I venture to suggest that, virtually without exception, the occurrence of all taxa listed from historical times to the present day has been of an essentially casual or ephemeral nature. This is based on the author's personal knowledge over the last forty years, coupled with the inferences gained from comments in the literature of Lees (1888) and others. This contention is reinforced when one considers that the overwhelming majority of the species involved are arable weeds which come and go according to the changing pattern of crop rotation and other agricultural practices, the temporary dumping of farm manure and other activities directly linked to human occupancy. All these factors militate against the suggestion of any permanent or even semi-permanent establishment of such plants, or the creation of isolated refugia which remain undisturbed by human activity for considerable lengths of time.

The above remarks are substantiated at first hand when we consider the case of the famous 'shoddy weeds' episode, the heyday of which lasted from about 1980 to 1995 in the 'Rhubarb Triangle' area of East Ardsley, Rothwell and Wakefield in West Yorkshire. Here, the agricultural practice was geared essentially to the production of root crops which were 'manured' with wool shoddy waste (a mixture of discarded imported wool waste and rags) from the industrial mills of the Heavy Woollen District of West Yorkshire, based around Batley and Dewsbury. The application of this 'manure' resulted in the appearance of very many exotic species (some being first records for Great Britain) which were introduced as seed in the fibres of the imported wool from Europe and further afield. These invaders continued to appear as long as wool shoddy was being used in appreciable quantity as fertiliser on the fields. In the late 1990s, however, the main focus of agricultural production changed markedly from root crops to cereal production, which did not require the application of wool shoddy fertiliser. Predictably, the occurrence of the contingent of strange alien colonists immediately diminished, such that now, in the second decade of the 21st century, minimal amounts of shoddy fertiliser are used and the occurrence of exotic adventives is negligible.

There was a suggestion during the 1980s heyday of the shoddy weed period that example(s) of this unique agricultural habitat should be considered for selection as Sites of Scientific Interest (SSI) in West Yorkshire – now variously known as Sites of Interest for Nature Conservation (SINC) or Local Wildlife Sites (LWS). This suggestion was never implemented as, after consultation with representatives from English Nature (now Natural England), it was felt that the assemblage of plants was too ephemeral, impermanent (and also non-native!) to justify recognition as permanent, established (or even semi-established) refugia. This decision was vindicated, as we have seen above, when the change from root crop to cereal production took place.

In the table below, (EX) in the IUCN Threat/Non Threat column indicates that the plant is believed extinct in VC63, with details of the last occurrence being given in Column 3.

Species	UK Status (Preston *et al.*, 2002)	VC63 Status or Dates/ details of last verified occurrence, where known	IUCN Threat/ Non Threat
Papaver argemone	Locally frequent	Rare	VU
Ranunculus arvensis	Locally frequent	Rare	CR
Adonis annua	Rare	Maltby area, 1900	EN (EX)
Euphorbia exigua	Locally abundant	Occasional	NT
Rumex alpinus	Locally frequent	Rare	NT
Spergula arvensis	Abundant	Widepread	VU
Silene noctiflora	Locally frequent	Occasional	VU
Silene gallica	Scattered	Branton, 1937	EN (EX)
Chenopodium bonus-henricus	Widespread	Fairly widespread	VU
Chenopodium glaucum	Scattered	Doncaster, 1976	VU (EX)
Chenopodium vulvaria	Rare	East Ardsley, 1981	EN (EX)
Chenopodium urbicum	Rare	East Ardsley, 1981	CR (EX)
Chenopodium murale	Scattered	Rare	VU
Galium tricornutum	Rare	Bolton, Bradford, 1990	CR (EX)
Lithospermum arvense	Locally frequent	Medge Hall, 1976	EN (EX)
Hyoscyamus niger	Locally frequent	Very rare	VU
Veronica triphyllos	Very rare	Cantley Park (1978)	EN (EX)
Misopates orontium	Locally frequent	Very rare	VU
Stachys arvensis	Widespread	Scattered	NT
Galeopsis segetum	Extinct	Barnby Dun, 1885	EX (EX)
Galeopsis angustifolia	Scattered	Occasional	CR
Galeopsis speciosa	Widespread	Scattered	VU
Nepeta cataria	Locally frequent	Very rare	VU
Campanula rapunculus	Very rare	Very rare	EN
Centaurea calcitrapa	Very rare	Rothwell, 1986	CR (EX)
Arnoseris minima	Extinct	Finningley area, 1950s ?	EX (EX)
Anthemis arvensis	Locally frequent	Rare	EN
Anthemis cotula	Locally frequent	Occasional	VU
Glebionis segetum	Locally frequent	Scattered	VU
Valerianella rimosa	Rare	Cantley Park, 1983	EN (EX)
Valerianella dentata	Locally frequent	Cantley Park, 1983	EN (EX)
Caucalis platycarpos	Not listed	Lees (1888)	EX (EX)
Scandix pecten-veneris	Locally frequent	Clay Bridge, 1996	CR (EX)
Bupleurum rotundifolium	Very rare	Very rare	EN
Carum carvi	Scattered	Very rare	EN
Imperatoria ostruthium	Scattered	Wentworth, 1935	NT (EX)
Torilis arvensis	Scattered	Very rare	EN
Lolium temulentum	Rare	Very rare	CR
Apera spica-venti	Locally frequent	Occasional	NT
Bromus secalinus	Scattered	Rare	VU

5) Grey Area Species – Native or Introduced

The small selection of taxa included under this heading are those plants for which there is, at present, no concurrence of opinion among the experts as to whether they are native or of introduced origin in any particular situation or location. All have a definite claim to be of cultivated or garden origin in many situations.

Species	UK Status (Preston *et al.*, 2002)	VC63 Status – Native, unless otherwise stated	IUCN Threat/ Non Threat
Helleborus foetidus	Widespread	Occasional	LC
Helleborus viridis	Widespread	Occasional	LC
Dianthus armeria	Scattered	No Modern Records	EN
Fritillaria meleagris	Scattered	Local	WL

6) Unconfirmed Species

This section contains just what it says - those plants which have been reported but have never been confirmed. Some or, indeed, most of them are likely to have been misidentifications for other closely related species e.g. Great Pignut *Bunium bulbocastanum* for Pignut *Conopodium majus*, while others have never, to our knowledge, been correctly recorded in the Vice County e.g. Large Yellow-sedge *Carex flava*.

Species	UK Status (Preston *et al.*, 2002)	VC63 Status – Native, unless otherwise stated	IUCN Threat/ Non Threat
Equisetum variegatum	Scattered	---	LC
Dryopteris x brathaica	Not listed	---	Not listed
Cornus suecica	Locally frequent	---	NT
Primula elatior	Local	---	NT
Arctostaphylos alpinus	Local	---	LC
Galium pumilum	Rare	---	EN
Stachys germanica	Very rare	---	VU
Thymus serpyllum	Very rare	---	LC *?
Melampyrum sylvaticum	Rare	---	EN
Euphrasia confusa	Locally frequent	---	DD
Crepis mollis	Local	---	EN
Tephroseris integrifolia ssp. *integrifolia*	Rare	---	EN
Bunium bulbocastanum	Rare	---	LC *?
Epipactis leptochila	Rare	---	DD
Dactylorhiza kerryensis	Scattered	---	Not listed
Orchis anthropophora	Scattered	---	EN
Carex saxatilis	Scattered	---	LC
Carex flava	Very rare	---	VU
Puccinellia fasciculata	Locally frequent	---	VU
Deschampsia cespitosa ssp. *alpina*	Rare	---	DD
Aira caryophyllea ssp. *multiculmis*	Not listed	---	Not listed

Aims and Future Plans

As stated above, this paper is entirely a work-in-progress document – a first stage at producing a viable Red Data Book for Vascular Plants in VC63. Much fieldwork is needed to achieve what I would regard as a comprehensive reference source for rare and scarce plants in the region – to put flesh on the bare bones of this present provisional checklist! I am intending to circulate definitive survey guidelines and an inventory of suggested targets in Spring 2013, with a view to organising a series of field trips for Rare and Scarce Plant Recording in the 2013 field season, and I am hereby encouraging and inviting my indefatigable, stalwart, South Yorkshire Plant Atlas recording team, members of Bradford Botany Group, YNU members (and anyone else keen to help!) to join me again and take up the challenge of this new project. In the meantime, if any of you have accurate current information on any of the plants listed above and, particularly if you

can provide amended or updated information on any of those which we believe are currently extinct in the Vice County, then please do get in touch as such data will be very valuable. Please get in touch, also, with any comments, criticisms or other thoughts on the information set out in this paper. Many thanks in advance for any help you can give.

References

Cheffings, C.M. & Farrell, L. (2005) *The Vascular Plant Red Data List for Great Britain. Species Status* 7, 1-116. JNCC, Peterborough.

Lees, F.A. (1888) *The Flora of West Yorkshire*. Lovell Reeve, London.

Miller, E. (1804) *History and Antiquities of Doncaster*. Doncaster.

Murgatroyd, F.K. (1995) *The Flora of the Parish of Halifax*. Halifax Scientific Society.

Perring, F.H. & Farrell, L. (1977) *British Red Data Books : 1. Vascular Plants*. Society for Nature Conservation, Lincoln.

Perring, F.H. & Farrell, L. (1983) *British Red Data Books : 1. Vascular Plants*. Edn 2. Royal Society for Nature Conservation, Lincoln.

Preston, C.D., Pearman, D.A. & Dines, T.D. (2002) *New Atlas of the British and Irish Flora*. Oxford Univ. Press, Oxford.

Stace, C.A. (2010) *New Flora of the British Isles*. 3rd Ed. Cambridge Univ. Press. Cambridge.

Stewart, A., Pearman D.A. & Preston C.D. (1994) *Scarce Plants in Britain*. JNCC, Peterborough.

Wigginton, M.J. (ed) (1999) *British Red Data Books : 1 : Vascular Plants*. 3rd Ed. JNCC, Peterborough.

Wilmore, G.T.D. (1997) Rare and Scarce Plants Documentation in VC63 (South-West Yorkshire), *BSBI News* 77, 23-27.

Wilmore, G.T.D. (2000) *Alien Plants of Yorkshire*. Yorkshire Naturalists' Union, Bradford.

Wilmore, G.T.D., Lunn, J. & Rodwell, J.S. (2011) *The South Yorkshire Plant Atlas*. YNU & Y&HEDT.

The Gledhow Valley Woods Nest Box Scheme

Martin Calvert
email: martin.calvert1@sky.com

I moved to the Gledhow area of Leeds in 1986, near to the woods on either side of Gledhow Valley Road. As a birdwatcher I soon realised that the provision of nest boxes there might ease a shortage of suitable natural breeding holes. I hoped to attract Pied Flycatcher, which readily takes to nest boxes.

After consultation with the appropriate officer at Leeds City Council, the Gledhow Valley Woods nest box scheme started in 1989 with an initial 17 boxes, of which 12 were standard boxes with holes designed for Blue Tits and Great Tits, together with 5 open-fronted boxes.I soon learned where not to place boxes as in certain locations some were regularly knocked down and/or vandalised. Luckily, not much vandalism occurred during the breeding seasons and nowadays it is rare.

Each winter I try to replace up to 8 boxes and add a few new ones. The boxes last for up to 12 years, occasionally longer. All the hole boxes in the Woods have metal plates fitted round the entrance hole as Grey Squirrels like to enlarge holes or remove lids if they can. After no success with the open-fronted boxes, all the boxes are now standard hole boxes.In the breeding season the boxes are checked weekly for 7 weeks from the beginning of May. The first check reveals a range of activity. Some Great Tits will be feeding young up to 14 days old by this time whereas

most pairs will still be laying or incubating eggs. It does seem that the more boxes I put up, the more attempts at breeding are made. On average, 5.5 of every 10 extra boxes put up will be occupied, 3.7 by Great Tits and 1.8 by Blue Tits (see Table 1). The percentage of boxes used for a breeding attempt was 91% in 1990 and, apart from a few years at 50-55%, is generally around the 70-80% mark. The numbers of pairs attempting to breed has risen from 8 in 1990 to 84 in 2012. A breeding attempt is defined as the construction of a nest.

Table 1. Overall Use of Nest Boxes 1990-2012

Year	Total no. of hole boxes	Breeding attempts	% of total no. of boxes	Successful	% of total no. of boxes	Numbers fledging	Average per box
1990	34	31	91.2	25	73.5	189	7.6
1991	37	33	89.2	30	81.1	223	7.4
1992	39	26	66.7	24	61.5	200	8.3
1993	44	31	70.1	27	61.4	214	7.9
1994	45	34	75.6	28	62.2	219	7.8
1995	52	38	73.1	33	63.5	262	7.9
1996	68	51	75.0	47	69.1	331	7.1
1997	69	50	72.5	45	65.2	333	7.4
1998	70	57	81.4	39	55.7	255	6.5
1999	69	39	56.5	30	43.5	192	6.4
2000	68	52	76.5	44	64.7	334	7.6
2001	68	51	75.0	44	64.7	298	6.8
2002	68	55	80.1	49	72.1	358	7.3
2003	74	61	82.4	54	73.0	308	5.7
2004	75	63	84.0	54	72.0	364	6.7
2005	83	71	85.5	53	63.9	270	5.1
2006	85	63	74.1	50	58.8	345	4.9
2007	93	67	72.1	55	59.1	230	4.2
2008	94	66	70.2	43	45.7	176	4.1
2009	102	51	50.0	39	38.2	250	6.4
2010	109	56	51.4	47	43.1	335	7.1
2011	112	72	64.3	62	55.4	404	6.5
2012	114	84	73.7	59	51.8	246	4.2

The failure rate of breeding attempts is usually about 10-12% of the total number of boxes available for use. The major exceptions to this have been in 4 years only. The first was in 1998 when a Great Spotted Woodpecker learned how to predate the boxes using the same modus operandi each time. This was to create a hole at the back lower corner of one side of the box and then drag the chicks out. Thirteen boxes were predated that season, leading to much hurried strengthening of remaining boxes and replacement of damaged ones. Fortunately, only 3 such predations occurred in 1999 and none since then. Wet and cold weather in 2005, 2008 and 2012 led to food shortages and many nests were deserted at various stages. In 2008, 23 out of 66 attempts failed and in 2012, 25 out of 84 did likewise. In the years following the wet ones, i.e. 1999, 2006 and 2009, breeding attempts were significantly lower, presumably due to poor breeding success the previous year. It does not look good for 2013.

The boxes are used by Blue Tit, Great Tit and Nuthatch (see Tables 2 and 3). The number of Blue Tits using the boxes has shown a slow upward trend, apart from a couple of boom years and an odd low year, whereas Great Tit numbers have soared from 4 pairs in 1990 to a record 43 pairs in 2012. Nuthatches have made just 4 breeding attempts in boxes since 1990.

Table 2. Occupation of nest boxes by Blue and Great Tits, showing success rates.

	Blue Tits				Great Tits			
Year	Attempts	Successes	Fledglings	Average	Attempts	Successes	Fledglings	Average
1990	26	21	161	7.7	5	4	28	5.6
1991	29	26	195	7.5	4	4	28	7.0
1992	21	20	168	8.4	5	4	32	6.4
1993	25	22	179	8.1	6	5	35	5.8
1994	23	19	154	8.1	11	9	60	6.7
1995	25	21	170	8.1	12	11	86	7.8
1996	38	36	269	7.5	13	13	62	4.8
1997	37	34	272	8.0	13	11	61	5.5
1998	37	24	183	7.6	20	15	72	4.8
1999	26	21	136	6.5	13	9	56	6.2
2000	33	29	234	8.1	19	15	100	6.7
2001	30	25	181	7.2	21	19	117	6.2
2002	33	30	231	7.7	22	19	127	6.7
2003	32	27	180	6.7	29	27	128	4.7
2004	33	28	193	6.9	30	26	171	6.6
2005	39	27	145	5.4	32	26	125	4.8
2006	33	25	192	7.7	29	24	149	6.2
2007	36	27	121	4.5	30	27	105	3.9
2008	42	26	101	3.9	24	17	75	4.4
2009	32	26	184	7.1	19	13	66	5.1
2010	35	28	225	8.1	21	19	110	5.8
2011	36	30	205	6.8	36	32	199	6.2
2012	40	29	128	4.4	43	30	118	3.9

Table 3. Nuthatch Nest Box Occupation

Year	Attempts	Successes	Fledglings	Average
1995	1	1	6	6.0
2006	1	1	4	4.0
2007	1	1	4	4.0
2012	1	0		

There were no breeding attempts by Nuthaches in any other years.

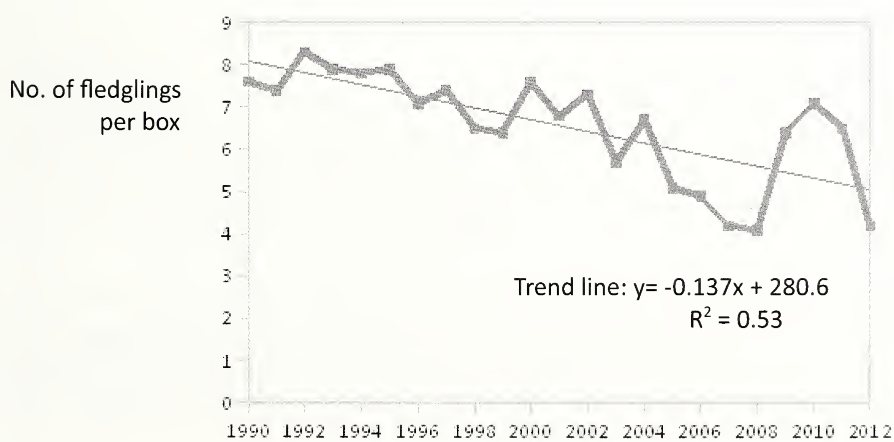


Figure 1. Average number of fledglings per box, all species.

The average number of fledglings from successful boxes is 7.5 for Blue Tits and 6.3 for Great Tits. In the cold wet springs of 2005, 2008 and 2012 the average was 4.3 and 4.0 respectively. However, there has been a statistically significant downwards trend in the average number of fledglings during the study period (see Fig. 1). The decline affects both Blue Tits and Great Tits. In the Great Spotted Woodpecker year of 1998 the productivity of surviving nests was normal, as it was whole broods that were predated, whereas in the wet and cold years, broods of 1, 2 or 3 chicks fledging was common. The maximum number of fledging birds was 404 in 2011 and the minimum was 176 in 2008.

Where there is a lack of suitable food for the nestlings, a typical find can be a nest containing a brood of dead chicks. One such box in 2005 contained 5 dead chicks of varying ages: 2 at 14 days old, 1 at 9 days, 1 at 6 days and 1 at 4 days, implying that the parents struggled to find enough food, resulting in regular deaths of their brood, before finally giving up. Chicks can be abandoned at any stage but it is usually up to 15 days old. In the poor years cited, some pairs still fledged average-sized broods, with Blue Tits producing between 1 and 7 fledglings and Great Tits from 1 to 6. Presumably these were experienced pairs, better able to cope with the awful weather conditions. However, 7 and 6 are low maximums as in other years pairs regularly fledged up to 10 young.

Some birds are tidy nesters and, as their offspring succumb, their bodies are removed from the nest completely or removed from the nest cup to the nest rim. Others leave the bodies in the cup, where they get trampled on by the remaining siblings. Once I found a nest that had been constructed on top of a dead adult Great Tit that had presumably died while roosting in the box sometime in the winter months. The feathers were in good condition on an emaciated body.

In the years 2009-2011, 2 boxes, always in the same part of the woods, contained perfectly constructed, lined nests, each made from the same nest material but not containing any eggs. On checking these boxes in 2009, I found that there was a Great Tit sitting very low in one of the boxes each week it was checked for 5 weeks. However, only one of the boxes was occupied each week, so I presumed that this one Great Tit was moving between these 2 boxes. In 2010 and 2011 again there were 2 identical nests, and a Great Tit was sitting low in just one box for 3 weeks at least, but again no eggs. In 2012 there was just one box with a perfect nest in the same area but no sign of the Great Tit. My thoughts are that it was one bird having a phantom incubation. I have not come across this behaviour before.

One pair of Great Tits usually has a second brood each year. It is usually a smaller clutch of eggs and is not always successful. Very occasionally 2 pairs lay a second clutch, but I have never found any Blue Tits doing the same. Looking at the period 1990-2012, it can be seen that in the first 13 years overall productivity never fell below 6.4 fledglings per nest. That figure or greater has only been attained 3 times in the last 10 years. This is presumably due to the food supply during the breeding season affecting clutch sizes and the survival of the nestlings. It is a worrying trend.

In conclusion, the scheme has so far produced 6334 young birds from 981 successful nests. It has been very enjoyable to monitor the boxes and it is great to be in a Bluebell wood in May. Has the ambition bird ever appeared? Just once, in 2006, when a male Pied Flycatcher took up residence at a box between May 9th and 21st. Unfortunately, no female appeared so I will just have to keep checking those boxes.

Onset of Summer Plumage in Black-headed Gulls at Doncaster Lakeside, based on field observations January to March 2012

Colin A. Howes and **John A. Porter**
email: colinhowes@blueyonder.co.uk

Introduction

The general phenomenon of Black-headed Gulls *Chroicocephalus ridibundus* attaining their chocolate-brown head plumage in spring is familiar to even the most casual observer, although the precise monitoring of this and an examination of the timing and potential causations of spring moult would appear to be absent from the literature. Harris (1971) concentrated on the strategic aspects of primary feather moult in Herring Gull *Larus argentatus*, Lesser Black-backed Gull *L. fuscus* and Great Black-backed Gull *L. marinus*. Walters (1978) examined four gull species including Black-headed Gull, again focusing on primary moult only (April to September) and the work of Palomares *et al.* (1997) on Black-headed Gulls examined biometric variations rather than plumage.

During the winter months and up to late March, impressive evening roosts of gulls, numbering into the thousands, gather at Doncaster Lakeside, South Yorkshire (SE5901) providing one of Doncaster's ornithological spectacles. The primary species is the Black-headed Gull but to this can be added Common Gull *Larus canus*, Herring Gull, Lesser Black-backed Gull and Great Black-backed Gull. Rarer ones have also made visits at appropriate seasons as passage migrants or vagrants. These include Kittiwake *Rissa tridactyla*, Little Gull *Hydrocoloeus minutus*, Mediterranean Gull *L. melanocephalus,* Yellow-legged Gull *L. michahellis*, Caspian Gull *L. cachinnans*, Iceland Gull *L. glaucoides* and Glaucous Gull *L. hyperboreus* (see Yorkshire Naturalists' Union Annual Bird Reports www.ynu.org.uk and Doncaster and District Ornithological Society website www.doncasterbirding.co.uk).

During the late summer, autumn and winter months both immature (first-year) and adult Black-headed Gulls have white heads with a small dark, anti-glare area in front of each eye and a conspicuous comma-shaped black mark behind the eye. Some also have a faint dark smudge above the eye which can extend faintly over the crown. The characteristic adult summer plumage is typified by the head becoming a smart dark chocolate-brown with a neat white post-ocular margin and a white nape. For first-year birds the brown head markings develop to varying degrees, retaining some white feathers (see Plate V, centre pages).

Methods

From January to the end of March 2012 regular visits were made to Lakeside where the progressive increase in numbers of Black-headed Gulls exhibiting summer plumage was monitored and elements of courtship behaviour were noted. Counts were generally made around sunset when large numbers of birds had already returned to the roost from feeding elsewhere, thus enabling a larger and more representative sample of the roost to be observed.

To avoid being dazzled by the setting sun and to ensure the gulls were well illuminated, counts were made looking to the east across the main bay. The number of gulls exhibiting summer plumage was expressed as a percentage of the sample counted.

Subsequently the daily daytime maximum temperatures for Bessacarr, Doncaster (as given in wwwaccuweather.com/en/gb/bessacarr) and day length in minutes calculated from daily

sunrise to sunset times at nearby Finningley Airport (53°28'1"N 1°0'0"W) (as given in http://www.sunrise-and-sunset.com/en/united-kingdom/finningley) were collated and used for comparative purposes.

Results

Evidence of Black-headed Gulls beginning to develop their summer plumage was first noticed on 17 January, when three (0.37%) out of a sample of 800 roosting gulls were exhibiting the characteristic chocolate-brown heads. The percentage frequencies of birds in summer plumage monitored on twelve dates from 17 January to 14 March 2012 are shown in Fig.1.

Discussion

Temperature: Examination of the data showed no statistically significant correlation between maximum daytime temperature and the percentage of birds exhibiting summer plumage, with a correlation coefficient well below 0.4.

Day length: There was a highly significant correlation between day-length and % of the population exhibiting summer plumage with a correlation coefficient of well over 0.95 (see Figure 2). Whilst this analysis cannot, of itself, demonstrate a causal relationship, there is a considerable literature based on laboratory experiments (i.e. Lofts & Murton, 1968; Payne, 1972; Stokkan, 1979) that demonstrate how environmental features such as day-length govern moult and breeding cycles in birds from temperate regions. One potential causal influence in the acceleration of plumage change may be a reinforced endocrinal response to the proliferation of courtship behaviour in the population from around mid-February (see Figure 1).

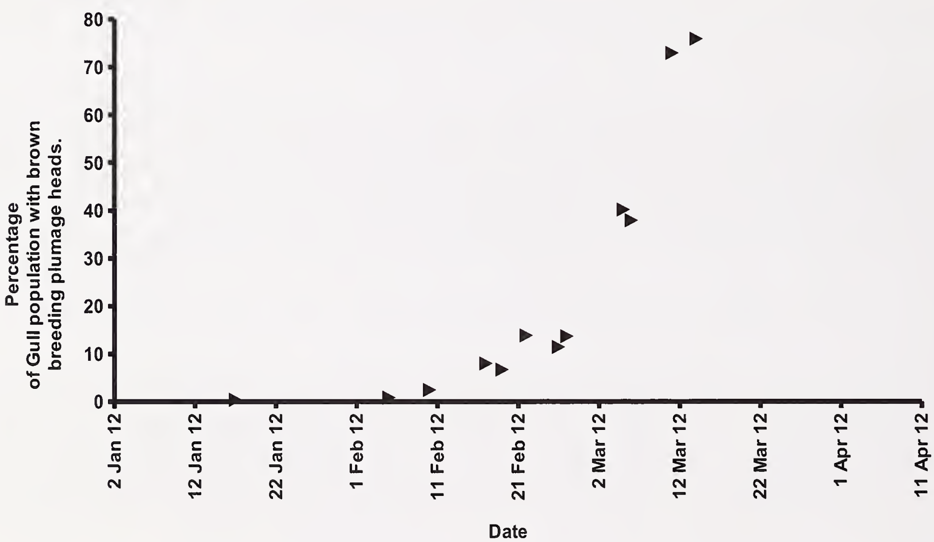


Figure 1: Percentage of roosting Black-headed Gulls at Lakeside showing onset of brown-headed summer plumage January to March 2012.

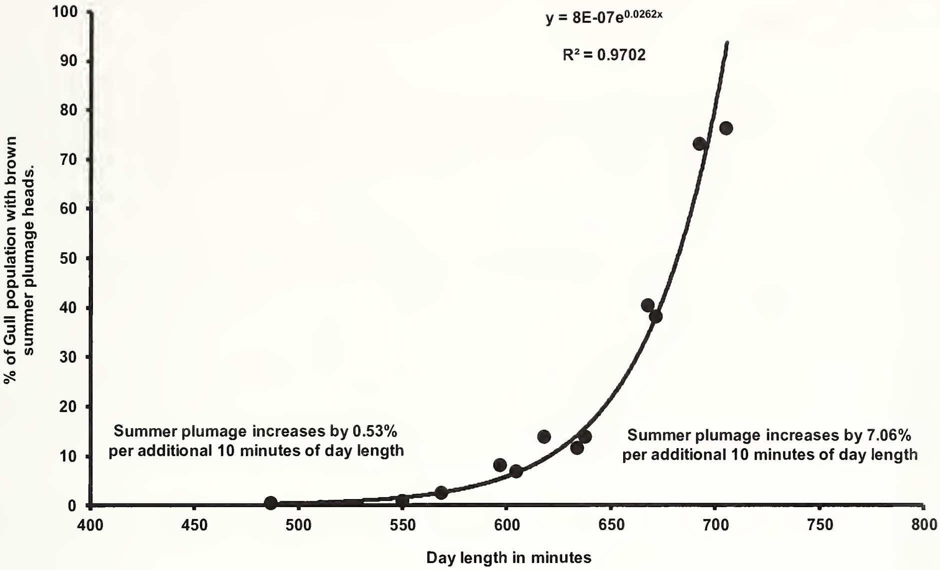


Figure 2: Relationship between the percentage of Black-headed Gulls showing onset of brown-headed summer plumage and increase in day length from January to March.

Acknowledgements

Thanks are due to Dr John R. Mather for valuable alterations to an earlier draft and for the annotated series of Black-headed Gull study skins from his collection kindly photographed by Ann Mettam (see Plate V, centre pages). Dr Paul Simmons drew attention to some literature references.

References

Harris, M.P. (1971) Ecological adaptation of moult in some British gulls. *Bird Study* 18: 113-118.

Lofts, B. and Murton, R.K. (1968) Photoperiodic and physiological adaptations regulating avian breeding cycles and their ecological significance.*J. Zool, Lond.* 155: 327-394.

Palomares, L.E., Arroyo, B.E., Marchamalo, J., Sainz, J.J. and Voslamber, B. (1997): Sex- and age-related biometric variation of Black-headed Gulls *Larus ridibundus* in Western European populations. *Bird Study* 44: 310-317.

Payne, R.B. (1972) Mechanisms and control of moult. In *Avian Biology* Vol. 2. (Farner, D.S. and King, J.R. (eds.), 104-158. Academic Press, New York.

Stokkan, K-A. (1979) Testosterone and day length-dependent development of comb-size and breeding plumage of male Willow Ptarmigan *Lagopus lagopus lagopus*. *Auk* 96: 106-115.

Walters, J. (1978) The Primary moult in four gull species near Amsterdam. *Ardea* 66: 32-47.

Notes on Sowerby's Beaked Whale strandings on the Yorkshire coast

D.E. Whittaker
email: dew.marine@hotmail.co.uk

Introduction

Sowerby's Beaked Whale, *Mesoplodon bidens*, is a member of the Ziphiidae, a group of small and secretive oceanic whales, found in all oceans over the deep sea where they have become deep-diving specialist feeders.

Sowerby's Whale is confined exclusively to the depths of the North Atlantic, away from the edge of the Continental shelf, and only in recent years has some of its biology begun to be elucidated. Although a diet of squid has been suggested as being most probable by much of the literature, there have been only limited findings of stomach contents, and recently available information suggests this whale is primarily piscivorous, feeding at depth on small bathypelagic fishes including principally myctophids (lantern-fish), diretmids and melamphaeids (Pereira *et al.*, 2011).

Having transgressed the continental shelf and entered the North Sea basin, Sowerby's Beaked Whale and other deep-diving whales, including the Sperm Whale, and the Northern Bottle-nosed Whale, are confined within an alien environment that not only becomes increasingly shallow as they progress further south within the basin, but which is also devoid of the particular oceanic trophic resources upon which they depend; the North Sea basin thus becomes a 'trap' for these whales in particular (Smeenk, 1997).

A comparatively large number of strandings of Sowerby's Whale has occurred around the British Isles during the period since the species was first discovered in 1800, and an analysis of all British and Irish records from 1800 to 2002, during which period there were 70 occurrences, demonstrated the widespread distribution of these strandings around the British and Irish coastlines, with as many records of the whale along the western North Sea perimeter as on the Atlantic-facing coastlines of the British Isles. North Sea occurrences accumulate principally between July and October. (MacLeod *et al.*, 2004).

Yorkshire records

All occurrences of this deep-water whale are of great interest. Records from the shallow central North Sea (ICES Division 4b between 56° 30'N and 53° 30' N) are not numerous, and only four specimens are known to have occurred on the Yorkshire sector. The first was an adult male 4.53 metres in length, which stranded alive in September 1885 within the Humber estuary at Chalk Bank, and was the first English occurrence (Southwell and Clarke, 1885 and 1886). No part of this whale was preserved.

Although subsequent, but rare, strandings occurred both to the north and south of the Yorkshire coastal area in the intervening years, it was not until October 1972 that another Yorkshire stranding occurred, at Filey Bay, followed only recently by two further occurrences, in August 2012 (again within the Humber estuary) and in September 2012 from Bridlington Bay at Fraisthorpe beach. Another female was found in early September 2012 at Wainfleet Flats, on the Lincolnshire coast, thus indicating that a small pod of the whales was involved in the strandings.

The Filey 1972 and the Humber 2012 specimens were both dissected by the author, though, unfortunately only some little time after their discovery and following brief internal examinations, the skeletons of both whales were subsequently prepared for inclusion in the marine collections held at Scarborough.

Stranding at Filey Bay October 10 1972

Although the stranding of this whale was the subject of a brief field note shortly afterwards (Massey, 1973), further details are given here for the first time. The whale appeared on the sands at Hunmanby Gap during the overnight tides of 10/11 October; it was in perfect condition, with no external evidence of trauma, and was believed to have stranded alive. This whale was an adult male 4.35m total horizontal length, with large teeth having a gum insertion length of 48mm. A female Sowerby's Beaked Whale and her calf had also live-stranded just a short time before, on October 9, on the beach at Bredene on the coast of Belgium (Dr P. E. Purvis (pers. comm.); De Smet, 1981) and it is probable these strandings were related and that all three individuals comprised a family group that had entered the North Sea together. When examined a few days after stranding, the body was almost entirely black, with numerous long white scars scattered along and across the body; a small patch of white marked the extreme angle of the mouth. Morphometric data are given in Table 1.

Following the recording of the stranding by still and cine photography, plaster moulds were prepared of large parts of the body to enable a cast of the whale to be preserved with the skeleton. The whale was dissected, following which the skeleton was removed; no stomach contents or platyhelmith parasites were found either in the stomach complex or the intestine. The head was removed intact and the anatomy of the blowhole was the subject of a dissection by Dr P.E. Purvis of the British Museum (Nat. Hist.) following which the skull was prepared.

The skull displays an unusual and remarkable deformity of the right occipital area where the bone has failed to ossify or occlude during early development, leaving an extensive foramen exposing the cranial cavity, but the edges of the foramen had continued to grow outwards as thick bony excrescences; a few small nodules of isolated bone that were apparently developing within the connective tissue enclosing this foramen were discovered during the final cleaning of the skull. No other part of the skull or of the rest of the skeleton shows any other anomaly and, in confirmation of the initial diagnosis that the animal was adult, the epiphyses of the vertebrae are fused.

Table 1. Morphometric data, male *Mesoplodon bidens* Filey Bay 10 Oct 1972

Horizontal length	4350mm
Width of flukes	1150mm
Upper snout to line of blowhole	580mm
Width of blowhole	90mm
Upper snout to anterior point of dorsal fin	3100mm
Basal length of dorsal fin	380mm
Upper snout to ant point of eye	600mm
Length of eye	35mm
Depth of eye	17mm
Posterior point of eye to ear	115mm
Upper snout to angle of jaw	440mm
Lower snout to angle of jaw	455mm
Lower snout to anterior point of tooth insertion	230mm
Basal length of tooth at gum insertion	48mm

Lower snout to anterior point of flipper	1020mm
Anterior point of flipper to mid dorsal line	660mm
Lower snout to anus	3135mm
Lower snout to anterior point of genital aperture	2800mm
Anus to centre of flukes	1440mm
Length of flipper, anterior point to tip	515mm
Length of flipper, posterior angle to tip	305mm
Circumference of body at eye	1200mm
" " anterior point of flippers	1600mm
" " anterior point of dorsal fin	2000mm
" " vent	1500mm

First Yorkshire occurrence of *Conchoderma auritum*

The stalked barnacle *C. auritum* is well known as an epibiont on the teeth of male Sowerby's Beaked Whales, and the Filey Bay whale was consequently examined for its presence. Attempts by the public to remove the tooth on the exposed left side of the head had destroyed any traces of possible attachment of *C. auritum* from the tooth of that side, but on the later lifting of the head from the sand, the right tooth was found to be almost hidden by an attached colony of this barnacle. This remains the only known occurrence of this barnacle on the Yorkshire coast.

Stranding at Stone Creek, 16 August 2012

Discovered on the Humber shore by a group of ornithologists, this whale could not initially be examined because a creek rendered it unreachable. A number of telephoto images were taken by the group showing a dorsal view, the only aspect available as the animal was laid on its side, but sufficient to enable its specific identification.

The animal appeared perfectly fresh and very recently stranded, but its sex was unknown. On the evidence from the images, which included gulls on and about the carcass indicating a fairly large size, and which also gave sufficient detail of the head to suggest that no teeth were visible above the gum, it was concluded that the stranding was of a sub-adult or adult female Sowerby's Whale.

Unfortunately the whale was transported about by subsequent tides and its position lost for some time until it was eventually deposited high up the shore. When examined in September the carcass was in poor condition and partially submerged in a pool of putrid water. As a result, the morphometric data that could be recorded was limited, nor could the sex be ascertained from external or internal genital features due to their condition, but the sex was reaffirmed as female from the head, no teeth having erupted above the gum. The horizontal length of the whale, 4.28 metres, together with such measurements as could be compared to the tabulated data in Table 1, of the Filey Bay 1972 male, all confirmed this female to be slightly smaller than that individual. Examination of the stomach complex and gut was made but no remains of prey, parasitic infection or ingested plastic waste were discovered.

Continued preparation of the skeleton currently prevents examination of the vertebrae to determine their fusion or otherwise with the epiphyses, and skeletal examination has thus been limited to the partially cleaned skull, upon which the animal is tentatively regarded as being adult.

Plate I. Yorkshire canals and their vegetation (see pp4-16).

Clockwise from above:

a). Barnsley Canal at Royston; a near monoculture of Reed Sweet-grass occupying the whole width.

b). Leeds & Liverpool Canal between Gargrave and Skipton; a lock by-pass channel provided a refuge for aquatic plants; Flowering-rush, in foreground, is rooted in joints between masonry blocks.

c). Dewsbury Branch of the Calder & Hebble Navigation; marginal vegetation included Water-plantain, Reed Sweet-grass and Bulrush.

d). Leeds & Liverpool Canal between Gargrave and Skipton; sheer sides and high turbidity apparently produced a habitat that was inimical to aquatic plants.

R. Goulder

Plant galls

Plate II. *Left*: Gall on Gorse *Ulex Europaeus* caused by the seed weevil *Stenopterapion scutellare.*
Right: The larva of the causal insect. See p16. *D.Parkinson*

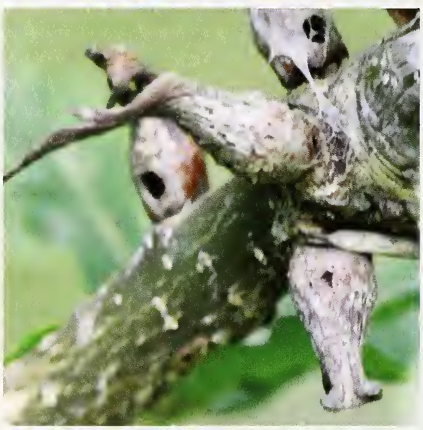


Plate III (see pp17-18).
Above left: Andricus gemmeus gall on oak at Carlton Country Park.
Above right: Subanguina graminophila nematode on Creeping Bent *Agrostis stolonifera.*
Left: Ram's Horn Gall *Andricus aries* on oak at Alton Water.
T.Higginbottom

Plate IV (see p58).
Eriosoma patchiae gall on Wych Elm *Ulmus glabra*, recorded in VC65 and VC69.
J.Newbould

Plate V. Black-headed gull plumage changes (see p35):

Adult in summer plumage (June).

Adult in winter plumage (December).

Adult commencing moult to summer plumage (January).

First year with juvenile wing coverts (February).

First year assuming partial summer plumage (March).

A. Mettam

Plate VI. Seals at Teesmouth (see pp42-49).
Above: Harbour (Common) Seal *Phoca vitulina.*
northeastwildlife.co.uk
Left: Grey Seal *Halichoerus grypus.* Note the pointed face characteristic of this species. *Ken Smith*

Plate VII. Recording in VC65 (see pp52-62).
Above left: Great Fen Sedge *Cladium mariscus* at Hell Kettles.
Above right: Species rich verge at High Oxnop (p61).
Left: The River Swale at Grinton.

J.Newbould

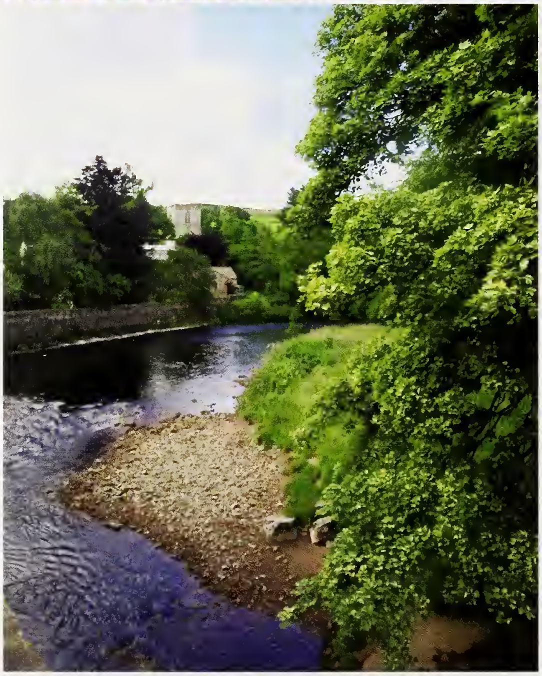


Plate VIII (see p70). Cromwell Bottom near Brighouse, site of May's VC63 meeting.

J.Simmons

Plate IX (see p79).
Coleophora serratella, seen as a late-instar case-bearing larva, on a birch leaf. *D.Parkinson*

Stranding at Fraisthorpe beach 30 September 2012
This whale was observed to strand alive about mid-day on the ebbing tide. Despite the efforts of a large number of people to try and save the whale during the following hours, it died later that day. The whale was an immature female, 4.10 metres long, and the smallest of those Sowerby's Beaked Whales so far recorded from the Yorkshire coast. A Cetacean Strandings Investigation Programme (CSIP) team from the Zoological Society of London carried out an autopsy the following day and made a brief video recording for inclusion in the Scarborough archives. The stomach contained numerous nematodes, but no other gut contents were seen; the gut was heavily stained with bile, suggesting the whale had not ingested for some time. A later press release by CSIP confirmed the whale had a bacterial brain infection of *Vibrio vulnificus*, the probable cause of its distress.

Incidence of Sowerby's Beaked Whale in the southern North Sea
Historically, the occurrence of Sowerby's Beaked Whale along the north-east (2 records) and Yorkshire (4 records) coasts is an extremely rare event, and in this context the stranding of two individuals on the Yorkshire sector during 2012 is particularly exceptional. However, a greater incidence of strandings of Sowerby's Beaked Whale is found in the southern North Sea (south of 53° 30′ N) with 14 strandings recorded for the Netherlands alone between 1900 and 2007 (Camphuysen *et al.*, 2008).

The few rare strandings known from the NE and Yorkshire coasts, therefore, give little indication of a greater frequency of individuals of this species that must be passing south through the central North Sea. The number of strandings of these whales in the southern North Sea, particularly on the coastlines of the Netherlands, Belgium and Germany, further suggests the increasingly distressed or diseased condition of these whales by the time they have traversed the North Sea basin and have reached the particularly shallow confines of the continental, eastern sector. The strandings from that area therefore more realistically indicate the frequency and numbers, not just of Sowerby's Whale, but also of other oceanic deep-diving whales penetrating the North Sea.

Moving and still images of three of the strandings, together with skeletal material of the Filey Bay 1972 and Humber 2012 occurrences, and the first Yorkshire specimens of *Conchoderma auritum*, detailed above, are preserved in the marine biological collections of the Yorkshire Coast Maritime Archive, a private facility located in Scarborough.

Acknowledgements
I am indebted to Andy Gibson for the opportunity to examine photographs of the Stone Creek stranding and for information leading to an examination of the carcass and recovery of the skeleton.

References
Camphuysen, K.,Smeenk,C., Addink,M., van Grouw, H., & Jansen, O.E. (2008) Cetaceans stranded in the Netherlands from 1998 to 2007 *Lutra* 51 (2): 87-122.
De Smet, W.M.A. (1981) Gegevans over de walvisachitgen (Cetacea) van de Vlaamse kust en de Schelde vit de periode 1969-1975. *Bulletin de l'institut Royal des Sciences Naturelles de Belgique* 53: 1-34.
MacLeod, C.D., Pierce, G.J. and Santos, M.B. (2004) Geographic and temporal variations in strandings of beaked whales (Ziphiidae) on the coasts of the UK and the Republic of Ireland from 1800 – 2002. *J. Cetacean Res. Manage.* 6(1): 79-86.
Massey, C.I., (1973) Sowerby's whale stranded in Filey Bay. *The Naturalist* 98: 28.
Pereira, J.N.., Neves, V.C.,Prieto, R.,Silva, M.A., Cascao, I., Oliverira, C., Cruz, M.J., Medeiros,

J.V.,Barreiros, J.P., Porteiro, F.M., and Clarke,D. (2011) Diet of mid-Atlantic Sowerby's beaked whales *Mesoplodon bidens*. *Deep-Sea Research* 158: 1084-1090.
Smeenk, C. (1997) Sperm whale deaths in the North Sea: Science and Management. Strandings of sperm whales Physeter macrocephalus in the North Sea. *Bull. Inst. R. Sci. Nat. Belg. Biol* B67 (Suppl.): 15-28.
Southwell, T. and Clarke, W.E. (1885) On the occurrence of Sowerby's Whale (*Mesoplodon bidens*) on the Yorkshire coast. *The Naturalist* 10: 385-386.
Southwell, T. and Clarke, W.E. (1886) On the occurrence of Sowerby's whale (*Mesoplodon bidens*) on the Yorkshire coast *Ann. Mag. Nat. Hist.* (5) 17: 53-59.

Seals at Teesmouth: a historical review

Colin A. Howes email: colinhowes@blueyonder.co.uk
Robert Woods email: robert.woods@inca.uk.com

Introduction

Reviews of the presence and status changes of Harbour Seal *Phoca vitulina* and Grey Seal *Halichoerus grypus* in the coastal and tidal waters of Watsonian Yorkshire (Tees to Humber) have been compiled in Clarke & Roebuck (1881) and Howes (1984, 1985a & b). The situation for the Holderness coast and the Humber region was reviewed and updated in Howes (2000) and the occurrences of the Arctic vagrants Harp Seal *Phoca groenlandica* and Hooded Seal *Cystophora cristata* were noted in Howes (1989, 1990) and in Massey & Howes (2003). The following account seeks to provide a similar review and update of the seal occurrences and status changes in the Tees estuary and adjacent Teesmouth areas from Hartlepool (NZ5333) in the north to Saltburn-by-the-Sea (NZ6612) in the south.

Seals at Teesmouth

Pre-19th Century

In the accounts of the bursar of the monastery of Durham, frequent references were made from Pentecost 1530 to Pentecost 1534 to sums paid for "Seaylls and Seall Calves", as the conservancy of the Tees during this period belonged to the Bishop of Durham. It is likely that at least some of these animals would have originated from the Tees estuary. Other evidence of the presence of seals is provided in a document dated 1530 which relates to regulations of the fisheries in the Tees; this mentions "Sealles, purposes [porpoises] and sturgeons and other like fish" (Lofthouse, 1887). Further indications of the antiquity of the tradition of seals frequenting the Cleveland coast and the Tees estuary are place names such as Seal Goit near Saltburn and Seal Sands within the Tees estuary, this latter featuring on a map dated 1762 (Lofthouse, 1887). Since Grey Seals only made their appearance as a breeding species in local waters in the 20th Century, it is assumed that the species referred to in these sources is the Harbour Seal.

References to seals inhabiting Teesmouth feature in the histories of Cleveland (Graves, 1808) and Hartlepool (Sharp, 1816). Clarke and Roebuck (*loc.cit.*), in reviewing Tees data from a number of references and correspondents, reported that in 1802 "they interfered to such an extent with the salmon fishery that determined efforts were proposed for their extirpation." Between 1820 and 1830 the Tees population was estimated to be about 1,000 strong, though it was claimed that the numbers had reduced by 1862 to 3 individuals. The inferred interpretation of this count may be misleading since the timing of the count is crucial with the seasonality of occurrence at a summer breeding/moult site.

Mid 19th Century Decline

Lofthouse (1887) noted that 20 to 30 seals could still be seen hauled out on the sandbanks during the 1860s but conceded that the population had probably been diminishing from the middle of the century due to the effects of industrial and urban developments around the tidal Tees and to the dramatic increase in water pollution and shipping. Indeed, Clarke and Roebuck (*loc.cit.*) commented that "the seals exhibited great dread of the steamboats which had greatly increased in numbers on the river..." Successive editions of Ordnance Survey sheets from the 19th Century to the present show that the estuary sandbanks and mudflats were progressively reclaimed for agriculture and industrial development such that now only about 10% of the original area remains. Although it was alleged that the last 'native' [Harbour] seal was killed c1870, sporadic records from the Teesmouth area from the 1880s to 1903 still persisted and are presented here in Table 1.

Coincidental with the decline of the Tees population, Harbour Seals began to be noticed in the Wash at least by the 1860s (Vaughan, 1978) and the Lincolnshire naturalist John Cordeaux noticed groups of 15 or 20 on the Wash mudflats in 1872 (Bonner, 1976). It would have been interesting to know if the Tees population had transferred to the Wash, ultimately giving rise to the largest English breeding population.

Table 1: Late 19th and early 20th century records of Harbour Seal in the Teesmouth region.

Date	Location	OS Grid ref.	Record	Reference
1880	Redcar	NZ6125	One seen on rocks	Lofthouse, 1887
1880-81	Redcar	NZ67	One shot during winter	Lofthouse, 1887
24.08.1881	Middlesbrough	NZ42	Two pursued by boats in the Dock entrance	Lofthouse, 1887
1881	Eston	NZ52	One opposite ironworks	Lofthouse, 1887
15.01.1883	Tees estuary		One shot	Lofthouse, 1887
02.1883	Eston Jetty	NZ5222	One captured	Lofthouse ,1887
25.10.1885	Eston Jetty	NZ5222	One seen and young female caught	Lofthouse, 1885
28.07.1887	Tees estuary		One exhibited alive in Middlesbrough market	Lofthouse, 1887
05.03.1890	Coatham Sands	NZ52	Young seal shot	Nelson,1890
28.01.1901	River Tees		One shot	Lofthouse, 1901
07.12.1902	Teesmouth		One caught	Nelson, 1903a
1903	Yarm	NZ4112	One shot	Nelson, 1903b

Mid 20th Century Return

Harbour Seals seem to have re-appeared in the Teesmouth area by the 1960s. One was seen off South Gare during the summer of 1964 and the species was reported but regarded as "rather scarce" (Bell, 1966). Bonner and Whittames (1974) suggested that the increasing Wash population could potentially function as a reservoir from which areas where indigenous Harbour Seal populations had been reduced might be replenished. A link with the expanding Wash population was indicated in 1971, when one of 197 dispersing Wash pups tagged on 26 June was found dead in the Victoria Dock at Hartlepool 66 days later on 30 August (Bonner & Whittames *loc.cit.*). Dispersing Wash-tagged pups arrive on the Yorkshire/Cleveland coast 32 to 66 days after tagging with a mean of 47 days (Howes, 1984).

In October 1977 five adults were present off South Gare, two of which were indulging in 'porpoising' courtship behaviour (Howes, 1984) and fourteen were counted during an aerial survey by the Sea Mammal Research Unit on 2 December 1977 (R.W. Vaughan pers. comm.). By the 1980s groups began to haul-out regularly on the 294ha Seal Sands National Nature Reserve within the Tees estuary (NZ5225; 5226 and 5326) but the formation of a viable breeding colony was possibly delayed by the epidemic of the Phocine Distemper Virus (PDV).

Phocine Distemper Virus

This is a paramyxovirus of the genus *Morbillivirus* that is pathogenic for seals, particularly affecting Harbour Seals. The population along the east coast of England (mainly the Wash) was reduced by 52% following the PDV epizootic in 1988 and by 22% by the epizootic of 2002. These events were responsible for the deaths of an estimated 17,000 Harbour Seals in the southern North Sea and it is anticipated that these epizootic events may recur at 15 or 17 year intervals (SCOS, 2010; Thompson & Duck, 2010). Since the Harbour Seal is a relatively sedentary species with well separated populations, disease transmission between populations suggests another vector species could have been involved. With Grey Seals being far less susceptible to the fatal effects of the virus and undertaking long distance movements, it is suggested that they could act as subclinically infected carriers of the virus between mixed colonies of Grey and Harbour Seals (Härkönen *et al.*, 2006).

Tees Seal Monitoring Programme

From 1989 to 1992 a Tees seals project was initiated by David Bellamy Associates. Two scientific personnel were employed (in association with Durham University Biology Department) to investigate the seal population.

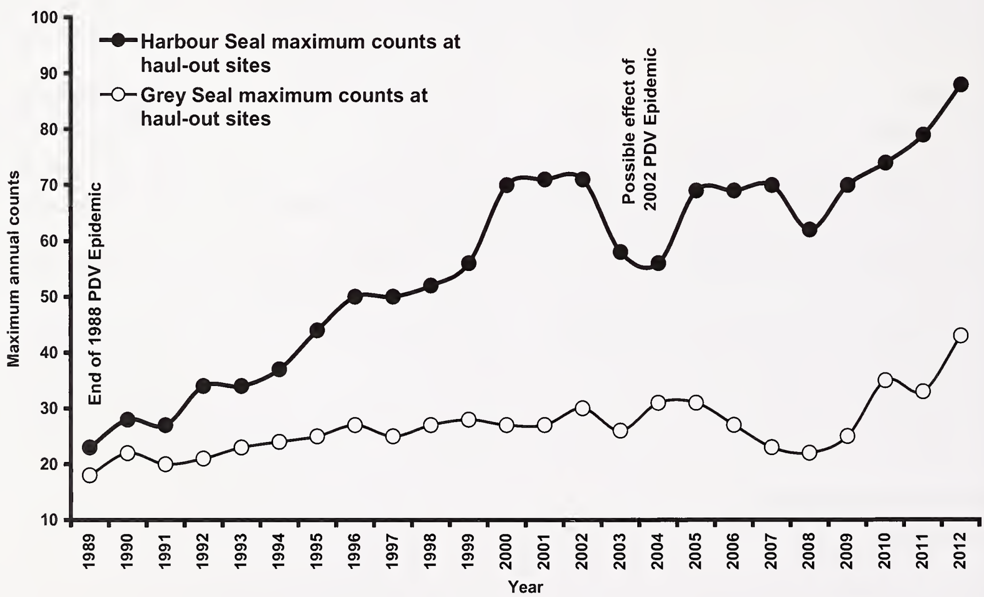


Figure 1: Maximum annual Harbour Seal and Grey Seal counts in the Tees Estuary. Based on Jackson & Wilson (1990), Wilson (1994), Smurthwaite (1996), Turner (2003), Gibson (2005) and Woods (2008 to 2012).

This was found to number about 23 individuals which were potentially subject to PDV and the effects of elevated organochlorine and heavy metal concentrations. In 1993 the relatively newly formed Industry Nature Conservation Association (INCA) adopted the running of the Tees Seal Monitoring Programme, publishing population data and detailing conservation management and public participation developments annually (Jackson & Wilson, 1990). The programme and its associated projects have produced a remarkable body of research, much of it available online (see references).

The maximum summer counts of Harbour and Grey Seals hauled out on the tidal mud- and sandflats from 1989 to 2012 are shown in Figure 1, based on the INCA reports.

Harbour Seal Pup Production

Harbour Seal (see Plate VI, centre pages) is the only seal to breed in the Tees estuary, since Grey Seal pups are unable to swim for some considerable time after being born and their nurseries are therefore dependent upon secure areas above the high water mark. Such areas are lacking in the intertidal features of the Tees, which comprise mainly intertidal mud- and sandflats. Wilson (2001) showed that, although Harbour Seal numbers increased from about 24 to 50 individuals between 1989 and 1997, the birth rate remained below 10% of the population. Seven of the twelve pups born live between 1989 and 1997 stranded dead, only five appearing healthy at approximately one month of age. Wilson (2001) also notes that though the seven non-viable pups had apparently received normal patterns of maternal care, they had gradually weakened, becoming unable to follow their mothers and had finally succumbed. Blubber samples from the first three moribund pups revealed elevated levels of polychlorinated biphenyl compounds (PCBs). Analysis of local fish and invertebrates also revealed elevated levels of PCBs. A possible causal link between the PCB levels and the poor reproductive performance was suggested (Wilson, 2001). Subsequently Rachel Smurthwaite (2006) has quantified the levels of the heavy metals zinc, copper, lead, cadmium, arsenic, chromium and mercury in the tissues and faeces of Tees seals and in their locally sampled prey (fish and crustaceans) (see http://etheses.dur.ac.uk/2651/1/2651_663.pdf).

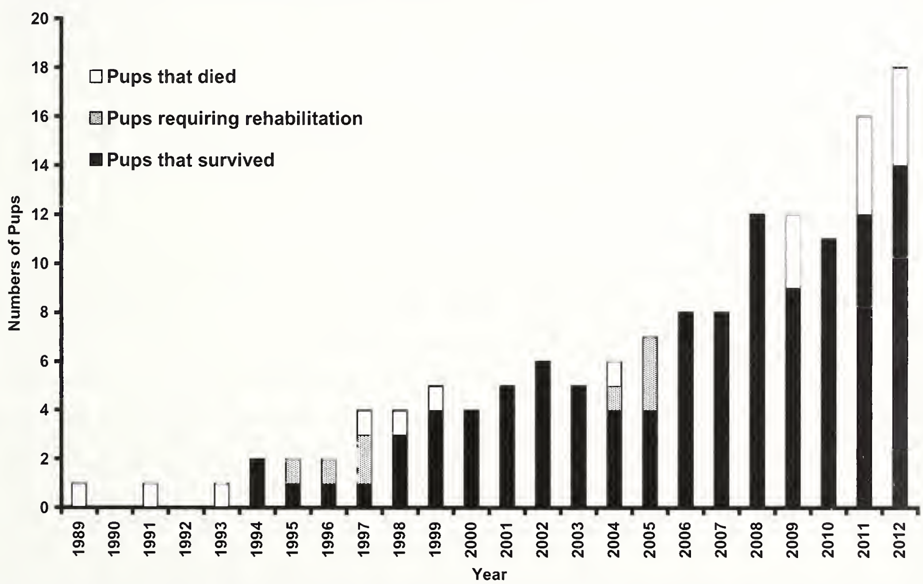


Figure 2: Annual Harbour Seal pup production in the Tees estuary 1989 to 2012 including numbers of deaths and individuals which required rehabilitation. Based on Jackson & Wilson (1990), Wilson (1994), Smurthwaite (1996), Turner (2003), Gibson (2005) and Woods (2008-2012).

Unsuccessful breeding took place in 1989, 1991 and 1993 but successful rearing of pups, though at a sub-optimal level, has occurred since 1994 (see Figures 2 and 3). Figure 2 shows that, despite pup mortality occasionally continuing to feature in annual censuses, the numbers of viable weaned pups has increased to 14 in 2012. However, this could simply be a function of increasing numbers of mature Harbour Seals summering at Teesmouth. By expressing the number of viable pups as a proportion of the maximum numbers of Harbour Seals counted during their summertime haul-outs, Figure 3 demonstrates that this proportion has risen from zero (1989 to 1993) to 15.9% in 2012 with an anomalous 19.4% in 2008. Although still below the normal reproductive rate of 20-30% of a population as described by Reijnders (1982), this could be an important expression of improving environmental conditions within the foraging range of the Teesmouth seals. This would appear to be consistent with a general reduction in the levels of heavy metals in the river sediments since the early 1990s (Mann *et al.*, 2009). It is also possible, however, that this increase in reproduction rate could simply be a function of increasing numbers of mature Harbour Seals summering at Teesmouth, although INCA has anecdotal evidence of large numbers of Harbour Seal remaining in the estuary throughout the year.

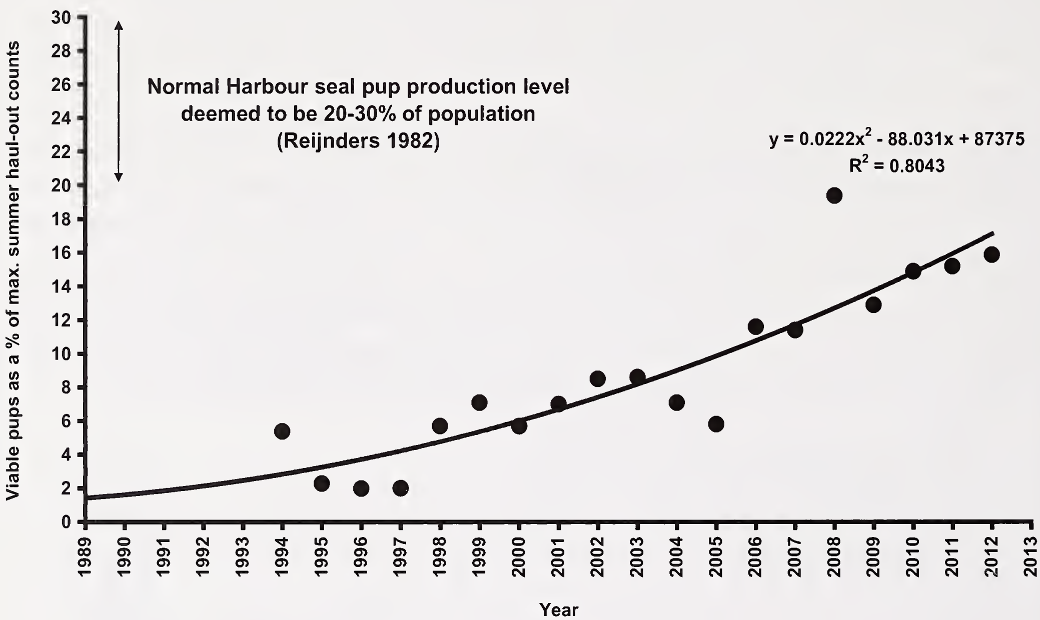


Figure 3: Viable pups as a % of the maximum summer Harbour Seal haul-out counts. Based on Jackson & Wilson (1990), Wilson (1994), Smurthwaite (1996), Turner (2003), Gibson (2005) and Woods (2008 to 2012).

Grey Seal

The few pre-19th Century allusions to Grey Seal on the Yorkshire coast came from the Teesmouth region. Graves (1808) listed "the great seal or sea calf of Pennant's Zoology" for the Cleveland area. A large seal skull thought to be from a Grey Seal was dredged from the Tees during the 1880s and a large seal thought to be this species was seen off Teesmouth on 18 November 1883 (Lofthouse, 1887). Anecdotal evidence dating from the 1920s of an apparent increase of Grey Seals feeding along the Yorkshire coast consisted of claims by the commercial fishermen that Grey Seals were becoming sufficiently numerous to warrant their control (Fortune, 1928). The source of these and subsequent Teesmouth specimens is probably the Farne Islands off the north Northumbrian coast, which, since the 19th Century

and until recently have supported the largest English breeding population. However, it is now equalled at Donna Nook to the south of the Humber mouth. Of the Grey Seal pups tagged between 1958 and 1980 on the Farne Islands 13 were recovered in the Teesmouth area (see Table 2).

Table 2. Farne Island tagged Grey Seals recovered in the Teesside area 1958 to 1980 (supplied by the Sea Mammal Research Unit)

Code	Date tagged	Date recovered	Journey time (days)	Recovery site
5160	25 Nov. 1958	23 Dec. 1958	29	Hartlepool
6014	24 Nov. 1960	26 Dec. 1961	33	Marske by the Sea
6157	17 Dec. 1960	11 Jan. 1961	26	Little Scar, Hartlepool Bay
6204	17 Dec. 1960	13 Jan. 1961	28	Coatham Rocks
6327	24 Dec. 1960	31 July 1961	39	South Gare, Teesmouth
6476	01 Nov. 1961	01 Feb. 1962	92	Hartlepool
6617	10 Nov. 1961	15 Nov. 1962	370	Bran Sands, Teesmouth
6770	17 Nov. 1961	26 Dec. 1961	39	Marske by the Sea
751	23 Dec. 1964	06 Jan. 1965	14	Little Scar, Hartlepool Bay
1316	22 Oct. 1968	04 June 1970	586	North Sea off Teesmouth
2096	17 Nov. 1970	30 Nov. 1970	14	Marske by the Sea
25097	23 Nov. 1979	20 April 1980	150	Coatham Sands
25146	26 Nov. 1979	06 May 1980	163	Coatham Sands

Table 2 shows that the appearance of Grey Seals in the Teesmouth area within the first twelve months after being tagged ranged from 14 to 163 days, giving a mean arrival time of 45 days.

The maximum annual counts at haul-out sites have ranged from 18 in 1989 to 43 in 2012, the trend being shown in Fig. 1. Breeding has not been recorded and is not expected as the Seal Sands and adjacent sand and mud banks are totally inundated at each tide, leaving no safe nursery sites for pups which cannot take to the water for up to six weeks (INCA 2002).

Dietary studies based on fish skeletal remains identified from 22 faecal samples collected during 1989 on a predominately Grey Seal haul-out at Seal Sands showed that small sized Cod *Gadus morhua*, Whiting *Merlangius merlangus*, Haddock *Melanogrammus aeglefinus,* Flounder *Platichthys flesus*, Dab *Limanda limanda* and Lesser Sand Eel *Ammodytes tobianus* were taken (Wilson, 1994).

Arctic Vagrant Seals

Hooded Seal, a relatively solitary pelagic animal of the North Atlantic, is normally confined to regions of pack ice and ice-flows in high arctic waters, shunning the circulating system of the Gulf Stream. Adults undertake long migratory movements to assemble at moulting areas where they remain from mid-June to mid-July. The eastern population gathers in the Denmark Strait to the east of Greenland. These seals feed on deep water prey taken from the sea bed (Massey & Howes, 2003). In 2004 two Hooded Seals, a juvenile and an adult presumed to have been its mother, were present off the ConocoPhillips jetties in the Tees estuary. The juvenile was rescued by the RSPCA but died in transit to the rescue centre in Norfolk. An autopsy showed rubber gloves, plastic and other debris in its stomach (Gibson, 2005). In November 2011 volunteers from British Divers Marine Life Rescue attended a Hooded Seal stranding at Saltburn-by-the-Sea (Anon, 2012). These would appear to be only

the second and third occurrences in Yorkshire (VC62) waters (see Massey & Howes, 2003).

Bearded Seal *Erignathus barbatus* is normally found in relatively shallow waters along the European, Asiatic and North American coasts of the Arctic Ocean. Its food consists entirely of bottom-living animals including shrimps, crabs, clams, whelks and bottom fish such as Flounder. On 20 January 1999, a specimen, evidently the third English record of this normally non-migratory seal, turned up in Hartlepool Dock, stayed for about two weeks and was much photographed (Gibson 2005).

References (* = available online)

*Anon (2012) British Divers Marine Life Rescue accessed via: http://www.thefreelibrary.com/Marine+team+in+call+for+support.-a0276184059

Bonner, W.N. (1976) *The stocks of Grey Seals and Common Seals in Great Britain*. NERC Publications Series C. No. 16.

Bonner, W.N. and Whittames, S.R. (1974) Dispersal of Common Seals (*Phoca vitulina*), tagged in the Wash, East Anglia. *J. Zool., Lond.* 174, 511-537.

Bell, D.G. (1966) *The Natural History of Teesmouth*. Cleveland Naturalists' Field Club and Teesmouth Bird Club, Stockton-on-Tees.

Clarke, W.E. and Roebuck, W.D. (1881) *A Handbook of the Vertebrate Fauna of Yorkshire*. Lovell Reeve, London.

Fortune, R. (1928) Yorkshire mammals in Taylor, E. W. (ed.) Yorkshire vertebrate zoology. *The Naturalist* 53, 208-209.

*Gibson, J. (2005) *Tees Seals Research Programme. Monitoring Report* No. 17. Industry and Nature Conservation Association (INCA), Billingham.

Graves, (1808) *The History and antiquities of Cleveland*. Jollie & Sons, Carlisle.

*Härkönen, T., Dietz, R., Reijnders, P., Teilmann, J., Harding, K., Hall, A., Brasseur, S., Siebert, U., Goodman, S.J., Jepson, P.D., Dau Rasmussen, T., Thompson, P. (2006) The 1988 and 2002 phocine distemper virus epidemics in European harbour seals. *Diseases of Aquatic Organisms* 68 (2), 115-30.

Howes, C.A. (1984) *Changes in the status of some Yorkshire mammals 1600-1980*. MPhil thesis, University of Bradford.

Howes, C.A. (1985a) Common seal *Phoca vitulina*, in Delany, M. J. (ed.) *Yorkshire Mammals* (pp. 177-181) University of Bradford, Bradford.

Howes, C.A. (1985b) Grey seal *Halichoerus grypus*, in Delany, M. J. (ed.) *Yorkshire Mammals* (pp.182-185) University of Bradford, Bradford.

Howes, C.A. (1989) Recent occurrences of harp seal *Plagiophilus groenlandicus* (Erxleben) in the North Sea. *The Naturalist* 114, 17-19.

Howes, C.A. (1990) Harp seals in Yorkshire and Humberside waters. Imprint 14, 15-18.

Howes, C.A. (2000) A Historical Review of Seals in the Humber Region. *Proceedings of the YNU Conference on the Humber Estuary Natural Area and the Holderness Coast. Supplement to the Bulletin of the Yorkshire Naturalists' Union,* 34, 65-71.

*INCA (2002) *Teesmouth's Seals*. Promotional Leaflet. Industry and Nature Conservation Association (INCA), Billingham.

*Jackson, D.B. and Wilson, S.C. (1990). *Tees Seals Programme: the feasibility study.* Report no. 1 prepared for Teesside Development Corporation. David Bellamy Associates, 208pp.

Lofthouse, R. (1885) Notes from the Tees. *The Field* 31 October, 640.

Lofthouse, R. (1887) The River Tees, its marshes and their fauna. *The Naturalist* 12, 1-16.

Lofthouse, R. (1901) Seals in the Tees. *The Naturalist* 26, 190.

Massey, C. I. and Howes, C.A. (2003) The Hooded Seal (*Cystophora cristata*): A new mammal for the Yorkshire coast. *The Naturalist* 128, 37-38.

Nelson, T.H. (1890) Common seal at Coatham. *The Naturalist* 15, 120.

Nelson, T.H. (1903a) Common seal at Teesmouth. *The Naturalist* 28, 61.

Nelson, T.H. (1903b) Seal at Yarm. *The Naturalist* 28, 91.

Reijnders, P.J.H. (1982). On the ecology of the harbour seal, *Phoca vitulina*, in the Wadden Sea:

population dynamics, residue levels and management. *The Veterinary Quarterly* 4(1), 36-42.
*SCOS (2010) *Scientific Advice on matters relating to the management of seal populations: 2010.*
Sharp, C. (1816) *History of Hartlepool.* Humble, Durham.
*Smurthwaite, R. (1996). *Tees Seals Research Programme. Monitoring Report* No. 8. Industry and Nature Conservation Association (INCA), Billingham.
*Smurthwaite, R. (2006) *Diet and heavy metal uptake by two top predator species in the Tees Estuary.* PhD Thesis, Durham University.
*Thompson, D. and Duck, C. (2010) *Berwickshire and North Northumberland Coast European Marine Site: grey seal population status. Report to Natural England* : 20100902-RFQ. p38.
Turner, R. (2003). *Tees Seals Research Programme. Monitoring Report* No. 15. Industry and Nature Conservation Association (INCA), Billingham.
Vaughan, W. (1987) A study of common seals in the Wash. *Mammal Review* 8 (1/2), 25-34.
Wilson, S. (1994). *The Tees Seals Research Programme. Monitoring Report* No. 5. Industry and Nature Conservation Association (INCA), Billingham. [Includes dietary studies of seal droppings]
*Wilson, S.C. (2001) Population growth, reproductive rate and neo-natal morbidity in a re-establishing harbour seal colony. *Mammalia* 65 (3), 319-334.
*Woods, R. (2008-12) *Tees Seal Research Programme Monitoring Report* Nos 20 to 24. Industry Nature Conservation Association (INCA), Redcar.

Rosemary Beetle *Chrysolina americana* - a new beetle record for Mid-west Yorkshire

G. Boyd 88 Coniston Avenue, Dalton, Huddersfield HD5 9PZ
Tel: 01484 453510

On 21 October 2012, while looking round my garden in the late morning sunshine, I noticed a dark, rounded beetle of medium size at rest on a senescent flower spike of *Agastache* sp. – an ornamental plant in the mint family. Examination of the insect, secured in a glass tube, soon showed that it was not a dark form of Harlequin Ladybird *Harmonia axyridis*, as I had initially thought, but was a much more interesting beast - one which I had never seen before and which had been practically unknown in Britain before the late 1990s.

I provisionally identified it as *Chrysolina americana*, a member of the family Chrysomelidae and sometimes called the 'Rosemary Beetle' after one of its favourite food plants. This beetle is widespread in Mediterranean lands, being associated with plants such as sage, lavender and other Lamiaceae. My identification was kindly verified by Mr. M. L. Denton, who had once found a specimen in Essex but knew of no Yorkshire records. Later Mr. R. Marsh, YNU recorder for Coleoptera, advised us of two earlier records for the county, both from VC61.

When examined closely *C. americana* is a beautiful and striking insect with an overall length of 7-8mm. and a dome-shaped body. It resembles a very large, somewhat elongate ladybird. The upper body surface is shiny, metallic dark green with five narrow orange-brown longitudinal stripes on each elytron. The pronotum bears similar stripes, though fewer in number. The head and legs are black. The insect is distinctive; the only British beetle with which it might be confused by non-coleopterists is *Chrysolina cerealis*, known from only a couple of sites in Snowdonia.

Little had been heard in Britain of *C. americana* before the early summer of 1994 when three specimens were found at the RHS Gardens in Wisley, Surrey, on plants of Rosemary *Rosmarinus*

officinalis, pot-grown from local stock, which had stood out of doors during the previous winter (Halstead, 1996). Close scrutiny of Rosemary and lavender plants growing elsewhere at Wisley disclosed no further specimens. The source of the infestation remained obscure but the beetle was found, sometimes in considerable numbers, at several other sites in south-east England over the following years (Duff, 2003; Menzies, 2003) and four years later was mapped from 28 UK hectads, including a location near Edinburgh (Cox, 2007).

The (international) trade in garden plants and shrubs is no doubt responsible for the rapid dispersal of this handsome insect across Britain; I myself may unwittingly have helped its spread by transplanting lavenders and Rosemaries from Northampton to Huddersfield on moving house in 2010, though I am not aware of records of *C. americana* from anywhere within 40 miles of my former home.

It is still unclear what conditions are required in Britain for this species to establish a permanent colony, and whether its life cycle in such a colony would be the same as in its native range. Nor have I seen any studies on predation or parasitism on *C. americana* in this country similar to those ongoing for other recent immigrant species such as the Harlequin Ladybird and the Horse-Chestnut Leaf Miner Moth *Cameraria ohridella* (Pocock *et al.*, 2011). Here we have a chunky, colourful, distinctive, garden-dwelling insect; many aspects of whose life history remain obscure. What an attractive subject for the attention of general naturalists! (Particularly for those, such as myself, who are growing less enthusiastic with age for forays across swamp and fen, moor and mountain in pursuit of our obsession). I shall certainly keep my garden Lamiaceae under close scrutiny during the coming summer.

References

Cox, M.L. (2007). *Atlas of the seed and leaf beetles of Britain and Ireland*: 36, 117.
Duff, A.. (2003). *British Wildlife* 14(4): 288-289.
Halstead, A.J. (1996). *Br. J. Ent. Nat. Hist. Soc.* 15(2): 136-137.
Menzies, I.S. (2003). *British Wildlife* 14(4): 280 (illustration).
Pocock, M., Evans, D., Straw, N. & Polaszek, A. (2011). *British Wildlife* 22(5): 305-313.

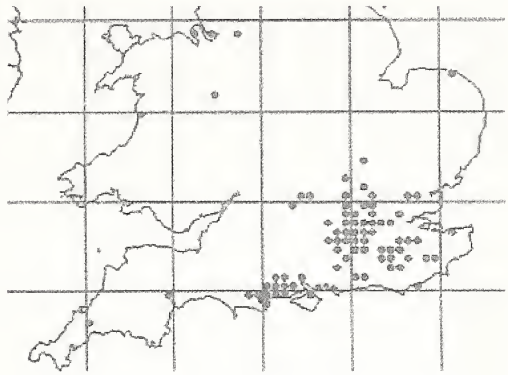
Field Note - Rhododendron leafhopper in VC64

Mark Darwell and John Bowers
email: j.k.bowers@o2.co.uk

The Rhododendron leafhopper *Graphocephala fennahi* is an Hemipteran of the family Cicadellidae. It was introduced into Britain from the USA in the 1930s. As its name suggests its food plant is the Rhododendron *Rhododendron ponticum* on which it feeds by sucking sap from the underside of leaves. Rhododendron leafhoppers are handsome and unmistakeable insects, *c.*10mm in length, green and red above and yellow below with a black stripe through the eye. The genus comprises two closely related species distinguishable only by examination of the genitalia but *Graphocephela coccinea* has never been recorded outside North America (Wheeler & Valley, 1980). Rhododendron leafhoppers over-winter as ova laid in the sepals of the flower buds. Adults are seen from mid-summer until November. In sunny conditions they can be found resting on the upper side of leaves, retreating to the underside on perception of danger. When disturbed they not only hop like other leafhoppers but readily fly.

Rhododendron leafhoppers do not cause the extensive damage to leaves that some other species of leafhoppers inflict on fruit trees and, despite high densities found in some populations in Southern England, no economic damage has been observed (*loc.cit.*). In his comprehensive study of Rhododendron pests Antonelli (1980) does not even mention *Graphocephala* species. However, it has recently been suggested that oviposition by *G. fennahi* is a vector for the transmission of the fungus *Pycnostysanus azaleae* which causes Bud Blast Disease on Rhododendron (Anon, 2012).

Figure 1. Distribution map of *Graphocephala fennahi* from the Auchenorrhyncha Recording Scheme.



G. fennahi is one of the target species in the Biological Record Centre RISC (Recording Invasive Species Counts) scheme (Fig. 1). It is mainly confined to Central Southern and South-east England and has not, according to the Auchenorrhyncha Recording Scheme website (www.Ledra.co.uk), spread as far north as expected given the distribution of its host-plant, suggesting either limited climatic tolerance or an inability to traverse the large gaps in the geographic distribution of its food-plant. Range extension is thus thought to be dependent on the transfer of eggs from nursery stock. However, the map shows some pockets outside its main range with one 10km square occupied in Norfolk, one on the Welsh borders and three in Merseyside. To these must be added a Yorkshire location, the landscaped gardens of Temple Newsam House in VC64. This is the most northerly location for the insect and indeed is to the north of the published distribution map. *G. fennahi* is found at Temple Newsam in Rhododendrons by the main lake (SE355322), between the lake and the estate farm, in the Walled Garden and in Rhododendrons in the adjacent woods. In hot weather in high summer it can be numerous. This year hardly provided those conditions but, even so, on 5 November 2012, after two nights of heavy frost, 16 were located in an 80m stretch of Rhododendrons and laurels adjacent to the main lake path. It has been present to our personal knowledge since at least 2000. Temple Newsam originally acquired its nursery stock from the north, from Parcevall Hall Gardens in Wharfedale, but in the last twenty years has sourced its stock from the Midlands. It is, therefore, likely that the colony started in the late 1990s when some Rhododendron plants were acquired from a site in the Midlands. If this is so, the Temple Newsam colony has survived for 12-15 years, which in turn casts doubt on the supposition that *G. fennahi*'s range extension is limited by climatic tolerance.

References

Anon, (2012) Biological control of the Rhododendron Leafhopper. www.squidoo.com/biologicalcontrol-of-the-rhododendron-leafhopper

Antonelli, Arthur L (1984), Pests of Rhododendrons. *Journal of the American Rhododendron Society*, 38(3), 35-41

Auchenorrhyncha Recording Scheme www.ledra.co.uk

Wheeler, A. G. Jr. and Valley, K., (1980) A Rhododendron leafhopper – field recognition and habits. *Journal of the American Rhododendron Society*, 34(4), 8-13

Recording in VC65 July 2012

John Newbould, Adrian Norris and Bill Ely
email: johna72newbould@yahoo.co.uk, adrianxnorris@aol.com and billely@hotmail.com

Introduction

Adrian Norris and John Newbould organised a week's residential survey based at Low Fremington on the River Swale. Terry Crawford, Tony Wardhaugh and Moira Wardhaugh also contributed. This report is a summary of what was achieved.

Records were generated in: 1 x 1km square in VC62
50 x 1km squares in VC65
1 x 1km square in VC66 (Durham)
7 x 1km squares in VC69 (Westmorland with North Lancashire)

A number of squares surveyed in VC65 are now in the administrative county of Durham including NY91 (Bowes) and NY81 (Balderhead) which is barely accessible by road, whilst SD78 (Dentdale) and SD79 (Garsdale) are now in Cumbria. We surveyed a new site in Stang Forest, with a different suite of species compared to an adjacent site surveyed in 2011. We also surveyed at Rutherford Bridge, which is the eastern end of the Brignall Banks Nature Reserve (an SSSI), and which must surely be worth a VC65 visit. The River Greta passes through this woodland, which appears to be accessible from either Brignall or Greta. JAN also visited Nosterfield LNR to record plant galls.

The VC66 visit on Saturday 14 July was to Hell Kettles SSSI (NZ281109) where there are two ponds. Croft Kettle is fed from an underground spring originating in the Magnesian Limestone and is crystal clear while Double Kettle is fed by surface water. The notable botanical species of this site is Great Fen-sedge *Cladium mariscus* at its only known location in the NZ 100km square (see Plate VII, centre pages). On this date WAE took part in the Richmond BioBlitz in NZ10 and all records were added to the NEYEDC files during the day or immediately afterwards.

On Sunday 15 July JAN and AN joined a Botanical Society of the British Isles (BSBI) meeting at Raven Seat (NY863033) to visit How Edge Scars. This area is surely worth a visit by birdwatchers with the farmer telling us of breeding Snipe, Oystercatcher, Lapwing (50 pairs), Ring Ouzel and Curlew.

The summary of species recorded is as follows:

Group	VC65	VC66	VC69	VC62
Vertebrates	20 mammals & 68 birds	1 fish, 5 birds		
Mollusca	557 records	22 records	59 records	7 records
Butterflies	7 species, 17 records		3 records	
Moths	32 records (3 nights with an actinic trap)	1 record	2 records	
Ichneumons	32 species representing 42 records, One new to Yorkshire and many new to VC65.			
Ladybirds	4 species = 8 records	1 record		

Odonata	2 records	1 record		
Orthoptera	1 record			
Plant Galls	251 records in 43 x 1km squares of 62 species on 44 host plants	10 species on six hosts	14 species on 11 hosts	
Other insects	77 species of other insects representing 174 records and 2 woodlice = 2 records			
Flowering Plants	653 records	78 records	51 records	
	1827 records	**119 records**	**129 records**	**7 records**

Data have been sent to the YNU Records Officer, except for Ladybirds and Orthoptera which have been deposited using the recently launched iRecord scheme (http://www.brc.ac.uk/iRecord/).

Hell Kettles VC66 (NZ281109)

This is north of the River Tees at Croft adjacent to the A167 and was surveyed with permission of the farmer at North Oxen-le-Fields. The site is a designated SSSI and has National Biodiversity Priority Habitats:

- Aquifer-fed naturally fluctuating water body.
- Hedges
- Neutral grassland

NVC Communities: Small area of W6 Alder–Stinging Nettle woodland; hedges: W21 Hawthorn-Ivy scrub; MG5 Crested Dog's tail–Common Knapweed grassland but here dominated by Yorkshire Fog *Holcus lanatus* and, in wet areas, MG8 Crested Dog's-tail–Marsh Marigold grassland; swamp vegetation includes a small area of S2 Great Fen-sedge on the margin of Croft Kettle and S4 Common Reed beds surrounding both water bodies.

Following one of the wettest summers on record, we found luxurious grass growth swamping many smaller herbs. Pignut *Conopodium majus* was present throughout the neutral grassland field together with small numbers of Chimney Sweeper moths *Odezia atrata*. Other neutral grassland forbs included Common Cat's-ear *Hypocharis radicata*, Bird's-foot-trefoil *Lotus corniculatus*, Quaking-grass *Briza media*, Betony *Stachys officinalis* adjacent to Double Kettle, Meadow Buttercup *Ranunculus acris*, Lady's Bedstraw *Galium verna*, Sheep's Sorrel *Rumex acetosella* and Self-heal *Prunella vulgaris*, together with Sweet Vernal-grass *Anthoxanthum odoratum*, Timothy *Phleum pratense* and Tufted Vetch *Vicia cracca*.

Between Double Kettle, the larger fishing pond to the north which is fed by surface water, and Croft Kettle to the south fed by an aquifer in the Magnesian Limestone, is a small area of wet grassland typical of the MG8 NVC community. Here, with the Marsh Marigold *Caltha palustris* and Common Spike-rush *Eleocharis palustris*, sedges such as False Fox-sedge *Carex otrubae* and Hairy Sedge *Carex hirta* were noted together with Southern Marsh-orchid *Dactylorhiza praetermissa*.

The vegetation types surrounding the two areas of open water are quite different from one another. Croft Kettle shines bright blue on an aerial photograph, reflecting the fresh supply of alkaline water. JAN has only seen this phenomenon once before at Mottisfont House, Romsey, South Hampshire (VC11). Two species of *Chara* have been reported but none were observed in 2012. Small Alder *Alnus glutinosa* were present on the southern bank. If these

are allowed to develop they will load nutrients (via rotting leaves) into the water body. Great Fen-sedge, which requires high levels of light, low nitrogen and a pH of 8, could be lost if the more common Alder grows larger (Hill *et al.*, 2004). Elsewhere, Common Reed *Phragmites australis* and a small area of Tubular Water-dropwort *Oenathe fistulosa* surround the pond.

Common Reed surrounds Double Kettle, which has fishing platforms in places. Brown Trout was seen on open margins. Other plants of interest included Sharp-flowered Rush *Juncus acutiflorus*, Hard Rush *J. inflexus*, Blunt-flowered Rush *J. subnodosus*, Greater Bird's-foot-trefoil *L. pedunculatus*, Amphibious Bistort *Persicaria amphibia* and Water Forget-me-not *Myosotis scorpioides*.

The northern hedge was a broken Hawthorn *Crataegus monogyna* hedge separating the field from neighbouring arable land, whilst the A167 roadside hedge was also dominated by Hawthorn and included White Bryony *Bryonia dioica* with the plant gall *Jaapiella bryonica*.

Birds included red data species Reed Bunting as well as Sedge Warbler and Moorhen with passage Swift and Oystercatcher; Common Blue Damselfly *Enallagma cyathigerum* was also recorded.

The VC65 surveys based at Low Fremlington 54°23'N 1°55'W

The principal objective of the surveys was to obtain invertebrate data in little-worked areas of North-west Yorkshire, taking the opportunity to record other groups when appropriate. Recording sites were selected randomly from previously unvisited squares where safe parking could be achieved. There was a small amount of casual recording whilst driving along.

Designations: Many of the places surveyed are located within the Arkengarthdale, Gunnerside and Reeth SSSI, Bowes Moor SSSI, Lune Forest SSSI, the Mallerstrang – Upper Swaledale SSSI and the Yorkshire Dales National Park.

Mammals

Without doubt, the most frequently recorded mammal was Rabbit and this was certainly under-recorded as we tended to note only the adults and not places where there were droppings. There was a single record of Stoat as a road kill at Healaugh (SE020990) and a single record of Common Rat, also a road kill, at Feetham Heights (SE999979). This summer we recorded just three Hedgehogs, all road kills, at Reeth (SE037995), Langthwaite (NZ005024) and West Park (NY995199). In 2011, we recorded a total of 13 road kills in three days in VC65.

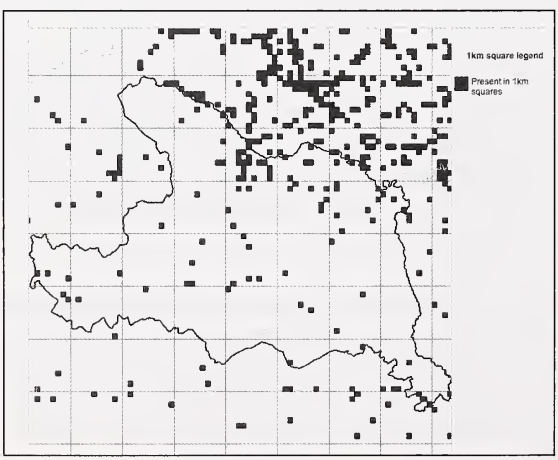


Figure 1. 1km square distribution of Hedgehog in VC65.
© NERC 2012 via NBN Gateway www.nbn.org.uk

However, the most interesting records were in some way the most disappointing. The evening of 12 July was the warmest of the week. AN and JAN walked towards Reeth and, at the place where Arkle Beck runs alongside the B6270 (to the east of the road bridge) is a tree-lined patch of still water (SE042991). Here we used a heterodyne bat detector loaned by the Sutton Poyntz Biodiversity Group. Four species of bat were tentatively recorded but readings were between 17 and 80mhertz. Noctule was seen flying at tree height at dusk. There was a reading at 48mhertz, which undoubtedly was Daubenton's Bat as three or four were seen skimming low over the water. We also had readings around 40mhertz, which was likely to be Common Pipistrelle and 55mhertz from Soprano Pipistrelle. No bats were recorded in the rougher water in open countryside 300m west.

Russ (2012) comments that using a heterodyne detector, whilst ideal for introducing people to the different calls of bats, is dependent on the experience and ability of the user and also on whether a good visual observation can be made. This reduces the number of species where a determination can be made with certainty, especially if there is only a brief fly-past. Russ goes on to recommend a frequency-division (FD) detector allowing recordings to be made. Broadband systems are available enabling simultaneous monitoring across the full range of bat frequencies. Basic FD recordings do not retain amplitude, allowing only limited analysis, whilst more expensive recorders restore amplitude information, enabling a more detailed sonogram analysis. The more sophisticated FD/zero system is the Anabat recorder with an ability to capture and analyse information on call structure and frequency parameters. This system comes complete with software AnalookW, which produces sonograms using zero analysis rather than the more common FFT. Such equipment would allow an 80% chance of differentiation between various other *Myotis* species e.g. Whiskered Bat and Natterer's Bat, which have a range of 40-60mhertz and could possibly have been present.

Birds

Just sixty-six bird records were collected during the visit. These ranged from four records of House Sparrow, mostly in villages but at Croft, south of the Durham border, a flock was feeding in a cornfield. Yellow Wagtail was seen on wires by the Yorkshire Water pumping station adjacent to Calf Hall Wood, Richmond, with Grey Wagtail present on rocks in the River Swale at Grinton Bridge and later that evening WAE reported Spotted Flycatcher on willows at the same location. Our host (Mark Stocks) reported that Kingfisher was often seen in the same area.

Our Sunday visit to Raven Seat was most interesting. This farm is virtually on the old Westmorland border west of Keld along a little-used road. Snipe and three Ring Ouzel were noted as we approached the farm. Oystercatcher, Lapwing and Curlew were calling to the west of the farm with all five birds breeding in the area. Elsewhere, Oystercatcher was seen most days with the largest number flying over being seven at Crackpot. Mark Stocks reported that Lapwing numbers have crashed in the Swaledale valley around Fremington but they were present in small numbers at Balderhead and Hunderthwaite Moor on our visits (both in VC65 but in the administrative county of County Durham). WAE insisted on stopping in a lay-by off the A66 adjacent to Bowes Moor where breeding Redshank complained bitterly for the 30 minutes or so that he swished his sweep net. We had three locations where Curlew was probably breeding and two places where Swallows were probably breeding.

Mollusca

645 records were located by the main members of the group which included AN, TC, TW and MW. The wet conditions may have resulted in slugs becoming more common and some smaller snail species being rarely noticed. Our results found most species of slugs to be in small numbers, whist the proportions of smaller snails appeared to be much the same as normal. Amongst the VC69 records we were able to add another site for *Vertigo alpestris* at Oxenthwaite (NY823119). This snail is usually found on mossy limestone walls shaded by trees.

Fig.2 Tetrad Distribution of *Vertigo alpestris* in VC65.

© NERC 2012 via NBN Gateway www.nbn.org.uk

It is perhaps worthy of note that the only new VC record for the trip was the location and identification of *Lymnaea (Stagnicola) fusca* at the ponds at Hell Kettles. The site proved to be very poor in molluscs, due mainly to the poor quality of the herbage surrounding the site. The freshwater molluscs proved to be particularly few both in numbers and in variety. Several of the ponds seem to have disappeared over the years, despite the very wet weather which has prevailed in recent years. All of the molluscan records will be placed on the NBN via The Conchological Society of Great Britain & Ireland.

Entomology

Lepidoptera: a disappointing week due to poor weather, with TC and JAN recording just eight species of butterfly with Ringlet the most frequent. TC found Large Skipper and Speckled Wood at Lartington. On the moors, Green-veined White was seen at 380m at How Edge Scars and at 350m at Balderhead. Small Tortoiseshell, Red Admiral, Meadow Brown, Ringlet and Speckled Wood were seen at the Richmond BioBlitz. We used an Actinic moth trap at Low Fremington on three evenings with disappointing results - just a dozen records including Garden Pebble *Evergestis forficalis* and Dusky Brocade *Apamea remissa.* Chimney Sweeper was recorded in a number of places on the Magnesian Limestone east of Richmond in the Croft-on-Tees area, where TC recorded Narrow-bordered 5-spot Burnet *Zygaena lonicerae* and JAN recorded Mullein Moth *Shargacucullia verbasci* larvae. For JAN, the most interesting record was of the Yarrow Plume-moth *Gillmeria pallidactyla* in MG1 grassland on a roadside verge north of Bielby. At Oxenthwaite Bridge in VC69 TC recorded Muslim Footman *Nudaria mundana*, whose larvae feed on small lichens, often on stone walls.

Ladybirds: JAN recorded 2-spot Ladybird *Adalia 2-punctata* at Nosterfield with 7-spot Ladybird *Coccinella 7-punctata* at Nosterfield and Croft–on-Tees in the lowlands and at 350m above Fremington on Stinging Nettle *Urtica dioica*. The national recorder Dr Helen Roy

has now verified these records for the national Ladybird Recording Scheme. WAE recorded Cream-spot Ladybird *Calvia quatuordecimguttata* at Bowes and Stone House Bridge in Dentdale while 7-spot Ladybird and the spotless *Rhizobius litura* were at Richmond.

Parasitica: The rare ichneumon *Banchus palpalis* was collected by WAE at Balderhead (NY903187) and is an addition to the Yorkshire list. *Banchus* species have become very scarce throughout the UK since the middle of last century. The additions to the VC65 list are *Ctenochira gilvipes* from Bowes and Gardale, *Acrotomus succinctus* from Richmond, *Glypta mensurator* from Stang Forest, Newby Head Gate and Dent Head, *Dusona bicoloripes* from Richmond, *Diadegma latungula* from Bowes, *Phrudus monilicornis* from Richmond, *Probles microcephalus* from Stang Forest, *Orthocentrus fulvipes* from Richmond, *Diplazon annulatus* from Dent Station, *Amblyteles armatorius* from Richmond and *Tycherus bellicornis* and *Tycherus nigridens* from Bowes. Some of these are quite common in more southerly parts of the county. A couple of dryinid wasps (parasites of leafhoppers but members of the Aculeata, not Parasitica) got into WAE's collecting bottle by mistake (either theirs or his) - *Anteon jurineanum* from the moors between Ribblehead and Dentdale (SD790813) and *Anteon pubicorne* from Bowes (NY997134).

Orthoptera: WAE swept a Common Green Grasshopper *Omocestus viridulus* on moorland above Balderhead (NY903187).

Odonata: JAN noted two species in VC65, Common Blue Damselfly *Enallagma cyathigerum* and Blue-tailed Damselfly *Ischnura elegans*, both at Nosterfield.

Plant Galls: JAN assisted by WAE made 250 records from 45 hosts in VC65. Of these, Hawthorn provided 52 records, 21% of the total, with 25 each of the records being the galls *Phyllocoptes goniothorax* and *Eriophyes crataegi*. There was also a single record of the fungal gall *Gymnosporangium clavariiforme* and one of the aphid *Dysaphis crataegi*. Sycamore *Acer pseudoplatanus* was the next most common host with 28 records of two gall mites, *Aceria pseudoplatani* forming an erineum and *Aceria cephalonea* forming small 'nails'. There were 19 records from Ash *Fraxinus excelsior* and just two from oak, which is rare in Swaledale. A single record of the Oak Apple *Biorhiza pallida* at Nova Scotia (NY992159) on a young tree and the Common Spangle gall *Neuroterus quercusbaccarum* on a street tree at Croft-on-Tees (NZ288097) were the only oak gall wasp records. Both are new to square NY within Yorkshire. WAE recorded the Cola-nut Gall *Andricus lignicolus* on Pedunculate Oak at Richmond.

In *The Naturalist* 137, pp48-49, JAN reported on the occurrence of the mite gall *Aceria tenuis* on Cock's-foot *Dactylis glomerata* and the Weevil gall *Apion rubens*, both in VC65. In 2012, he recorded both galls again at Raven Seat (NY863033) at 400m. This is the second report of *Aceria tenuis* and the third report of *Apion rubens* in VC65.

Table 2. Interesting Plant Galls from VC65.

Gall causer	Host plant	Group	Location
Aceria fraxinicola = *A. fraxini*	Ash *Fraxinus excelsior*	Gall Mite	Calf Hall Wood (NZ146006) and Low Whita (SD999979)
Nasovonia nigra = *N. compositella* ssp. *nigra*	Hawkweeds *Hieracium* sp.	Aphid	Reeth Bridge (SE042991)
Teraneura ulmi	Wych Elm *Ulmus glabra*	Aphid	Sandbeck West Bridge (SE167998) and Low Fremington (SE042991)

Gall causer	Host plant	Group	Location
Eriosoma patchiae (See Plate IV, centre pages)	Wych Elm *Ulmus glabra*	Aphid	Cotherstone (NZ006204 & NZ011200), Crackpot (SD974967), Croft (NZ285102), VC69 at Oxenthwaite (NY823119)
Dysaphis crataegi	Hawthorn *Crataegus monogyna*	Aphid	Nosterfield LNR (SE277793)
Rhopalomyia millefolii	Yarrow *Achillea millefolium*	Gall midge	Roadside verge north of Bielby(SE117941)
Cronartium ribicola	Red Currant *Ribes rubrum*	Fungal gall	Calf Hall Wood
Jaapiella bryoniae	White Bryony *Bryonia dioica*	Gall midge	Crow Beck (NZ277098) and in VC66 Croft-on-Tees (NZ285106)
Gymnosporangium clavariiforme	Hawthorn *Crataegus monogyna*	Fungal Gall	Feetham Holm (SD999980)
Livia juncorum	Toad Rush *Juncus bufonius*	Psyllid gall	Balderhead (NY904187)

A number of the plant gall records appear to be interesting but little information on the status of these species is available on the NBN Gateway.

Flowering Plants and Ferns

Broad Habitat types in the survey area:

1. Rivers: River Swale and Arkle Beck in Swaledale. River Greta (VC65, now within County Durham), River Tees at Croft on the County Boundary and Cotherstone (VC65 County Durham).
2. Boundary and linear features, hedgerows
3. Inland rock outcrops and scree habitats
4. Upland mixed ashwoods in the upper dale
5. Lowland mixed deciduous woodland (west of Richmond)
6. Wet woodland in valley bottoms
7. Upland hay meadows
8. Upland flushes, fens and swamps.

Surveys: No systematic surveys of the vegetation of the <u>Rivers</u> were undertaken nor invertebrate sampling. This was due to the high water levels and brown colouration of the fast flowing water following heavy rainfall during the previous week. Birds associated with rivers were noted.

<u>Hedgerows</u> were surveyed for invertebrates only, with no systematic vegetation surveys. However, the principal woody plants in the upper dale were Sycamore, Ash, Hazel *Corylus avellana* and Hawthorn. The ground flora included Dog's Mercury *Mercurialis perennis*, Ivy *Hedera helix* and Wood Melick *Melica uniflora* was plentiful north of Colt Park Wood SE059987.

<u>Inland rock outcrops and scree habitats</u>: The Chert quarries at Fremington Edge proved too difficult to survey but we did manage the rock areas above Oxnop Beck Head (SD938946) where Wall-rue *Asplenium ruta-muraria*, Black Spleenwort *A. adiantum-nigrum* and Brittle

Bladder-fern *Cystopteris fragilis* were located in rock crevices away from the grazing sheep. This area was really species-poor acid grassland with Sheep's Fescue *Festuca ovina* and Heath Bedstaw *Galium saxatile* forming NVC U4 community. There were surprises here such as Wild Strawberry *Fragaria vesca* at 498m.

It was How Edge Scars (NY866026), visited during the BSBI meeting led by Linda Robinson, the BSBI recorder for VC65, which proved to have the most interesting habitat of this type. Here a tufa spring provided Common Butterwort *Pinguicula vulgaris* and the wet rocks had Marsh Hawk's-beard *Crepis paludosa*, Primrose *Primula vulgaris*, Aspen *Populus tremula*, Hazel, Rowan *Sorbus aucuparia* and Bilberry *Vaccinium myrtillus*. The fern flora here included Beech Fern *Phegopteris connectilis* and Oak Fern *Gymnocarpium dryopteris*.

Upland Mixed Ashwoods: of NVC classification W9 Ash, Rowan and Dog's Mercury (Rodwell, 1991). Whilst preparing this report, it has been necessary to compare the survey results with representations of woodland boundaries on the 1:25,000 maps and with aerial photographs. This has been undertaken using the Bedfordshire Natural History Society's Grab a Grid Reference web page. The woodlands appear much larger on the aerial photographs than on the OS maps. The software for geo-rectifying such images is beyond the scope of a natural history society[1]. However, this increase in Dales woodland cover is in line with Hooftman and Bullock (2012) who demonstrate an increase in woodland cover in Dorset (VC9).

Woodland edges surveyed included Intake Wood above Fremington (SE04599), Rutherford Bridge (NZ034121), Brokes Lane (SE152995) and north of Throsgate Wood adjacent to Sand Beck west bridge (SE167997). We surveyed a ride in the Stang Forest at Doorgill Bridge (NZ023085) and some woodland at Thwaite (NZ035112). Typically Ash and Hazel are important in the understory of these Dales woodlands, with a significant amount of Sycamore. Rowan and Downy Birch *Betula pubescens* amongst the tree layer. Unlike in 2011, when we surveyed Gunnerside Gill, Alder was missing from the steep valley sides. Oaks were largely absent except for a few trees seen on a steep east-facing valley slope at Crackpot (SD975969). Linda Robinson considers that oak is only found at How Edge Scars and Grinton churchyard (pers. comm.). However, Rodwell illustrates transition zones of oak–birch woodland with the Ash–Rowan–Dog's Mercury woodlands at Kisdon Force (SD899011), an area we visited on the YNU V65 excursion in 2009. Wych Elm was a constant whilst English Elm *Ulmus procera* was rare. Hawthorn and Blackthorn *Prunus spinosa* were found mainly on the lower slopes. JAN was surprised how rarely Bird Cherry *P. padus* appeared on his woodland lists. Dog Rose *Rosa canina* and Honeysuckle *Lonicera periclymenum* were generally present as scrub. Amongst the herbs, Dog's Mercury was usually present, and Foxglove *Digitalis purpurea* indicated the more acidic nature of the soils. Crosswort *Cruciata laevipes*, Herb Robert *Geranium robertianum,* Strawberry, Herb Bennet *Geum urbanum* and Sweet Cicely *Myrrhis odorata* were found on the wood edges at lower altitudes.

The Stang Forest survey included roadside edges, a beck and a woodland ride. JAN has surveyed many plantations both in Yorkshire and Dorset and generally find that native trees and plants are found on the fringes and along woodland rides. Here there are none, with wild habitat represented only by moorland gill vegetation. However, the 1904 map held by North Yorkshire CC Archive Service shows moorland with no history of woodland. We are left to speculate whether the moorland or the current Sitka Spruce forest is the better carbon bank.

1 Up-to-date map information can often be found on OpenStreetMap.org and we recommend anyone visiting a new area to consult it as well as the official OS map. It can also be edited if observations do not correspond with what is shown. *Eds.*

Lowland mixed deciduous woodland: There are a number of these woods in the Swale valley in the Richmond area. We made a very brief visit (curtailed due to heavy rain and poor light) to the National Trust's Calf Hall Wood (NZ146005) where Ash and Beech *Fagus sylvatica* had a ground flora of Ramsoms *Allium ursinum*. Shrubs including Red Currant *Ribes rubrum* are present on a clay soil, showing the potential for a visit earlier in the season.

Wet woodlands in valley bottoms: During the survey, we visited a number of places in valley bottoms with rivers. Here, in the western areas, there is NVC W7 Alder–Ash–Yellow Pimpernel woodland community where we recorded mainly plant galls. In the eastern lowland areas e.g. along the River Tees at Croft is the lowland community, which may also contain Crack Willow *Salix fragilis* agg. Typical trees and shrubs present in the W7 woodland (in addition to Alder) include: Downy Birch, Ash, Rowan, sallows and Hazel. Alder is found in every 10km square in VC65. Grime *et. al.* (2007) describe it as having an altitudinal limit of 250m and requiring the moist soils of river banks and other waterlogged habitats. Its seeds are heavy and dispersed by wind or water, restricting potential sites for establishment. Recording of Alder was to a minimum of six figures to allow future mapping along riverbeds. Typical places for W7 Alder included Low Fremington – Reeth Bridge (SE042991), Thwaite Beck (NZ035112), Rutherford Bridge (NZ034121), Low Whita (SE00098) and Calf Hall Wood (NZ146006).

Lowland Acid Grassland: Whilst surveying along High Lane on the south side of the Swale valley (SD99009752), I discovered particularly herb-rich acid grassland at a little over the 300m contour. The JNCC habitat description (Anon, 2011) has a rather loose definition of upland and lowland, suggesting a boundary at around 300m. With around 40 plant species recorded in a small area, this is a good example of this habitat type although the size of the grassland area would cause difficulty in mapping as I estimate it is less than 0.25ha. Grasses ranged from Wavy Hair-grass *Deschampsia flexuosa*, Sheep's Fescue, Mat-grass *Nardus stricta,* Common Bent *Agrostis capillaris*, Quaking-grass, Sweet Vernal-grass to the larger Yorkshire Fog. Herbs included the Lady's-mantle *Alchemilla glabra*, rare Hardheads *Centaurea nigra,* Common Rock-rose *Helianthemum nummularium*, Tormentil *Potentilla erecta*, Sheep's Sorrel, Devil's-bit *Succisa pratensis* and Lady's Bedstraw *Galium verum*. This is a complex mix with a nearest fit to the NVC community U1 Sheep's-Fescue–Common Bent–Sheep's Sorrel.

Upland Hay Meadows: This was a major disappointment of the timing of our survey. Despite heavy rain, the vast majority of hay meadows had either been cut or were cut during our visit and so no surveys were possible. Swaledale is described as being one of the UKs important centres for this habitat type (Anon, 2011). We did look at a few roadside verges which are also included in this habitat type.

Upland Flushes, Fens and Swamps: The JNCC definition of this broad habitat includes wetlands in upland situations which receive water and nutrients from surface and/or groundwater sources as well as rainfall. Such areas are typically found above the limit of agricultural enclosure (Anon, 2011). Two places in particular were typical of this broad habitat type. Walking south from Raven Seat to How Edge Scars, we passed across moorland with MG6 Star Sedge -Sphagnum communities with the Soft Rush sub-community. Here Brown Bent *Agrostis canina* was interspersed with Heath Rush *Juncus squarrosus* and Mat-grass. Wet flushes featured Star Sedge *Carex echinata*, Marsh Thistle *Cirsium palustre* and Marsh Violet *Viola palustris*.

At High Oxnop, we found an interesting example of an upland flush running along the west roadside verge (SD929964) at around 400m (see Plate VII, centre pages). Here an example of NVC community MG9 Yorkshire Fog–Tufted Hair-grass was present with around 30 plants recorded in a 30m stretch. My attention was drawn to this verge by a rich display of Common Spotted Orchid *Dactylorhiza fuchsii* together with the ever-present hybrid seen in wet situations. Grasses present included Sweet Vernal-grass *Anthoxanthum odoratum* and Quaking-grass. Lady's Mantle was plentiful. In the running water, there was a starwort and Brooklime *Veronica beccabunga*. There were three species of rush including Soft Rush *Juncus effusus*, Jointed Rush *J. articulatus* and Round-fruited Rush *J. compressus*. Common Twayblade *Listera ovata* and Lesser Spearwort *Ranunculus flammula* were also present.

Botanical Data were assembled in Excel with an output showing a small range of the features tabulated in Plantatt (Hill *et al.*, 2004) with reference particularly to Ellenberg Indicator Values. Two of the roadside verge communities at High Oxnop (SD929964) and at High Lane (SD990975) were small discreet areas. At High Oxnop 36 species were identified, of which 35 are natives and just one, Sweet Cicely, is classed as a neophyte introduced after 1500AD. At High Lane all 40 plants found are considered native.

Table 3. Ellenburg Indicator Values on two botanical survey sites 2012.

Ellenburg values	Light requirements	Water requirements	pH	Nitrogen levels
High Oxnop	6.95	6.54	5.7	4.5
High Lane	6.8	5.7	5.2	4.1

For light a value of 7 reflects well-lit places with some partial shade.
For water a value of 7 indicates that plants are mainly in constantly moist or damp soils but not wet. Interestingly, in 2012 the High Oxnop site was mainly a stream.
A pH value below 6 indicates moderately acid soils whilst nitrogen levels of 4-5 are indicators of sites of moderate fertility. A repeat survey in perhaps ten years time would indicate any change.

The list of UK Biodiversity habitats is an interesting mix. Two significant habitats for birds are excluded from this list. The one major habitat we were seeing is the Yorkshire Fog – Soft Rush pasture NVC MG10 community. In particular, Averis *et. al.* (2004) discuss the sward typical of acid grassland communities, with large stands of Soft Rush together with Mat-grass, Sweet Vernal-grass, Sheep's Fescue and Heath Bedstraw. It was this type of grassland where we observed breeding Redshank and Curlew together with Oystercatcher, Snipe and Lapwing. The second excluded habitat, important for smaller birds, is scrub, which during our surveys occasionally included small areas of the NVC W23 European Gorse–Bramble community.

There are still many 1km squares we have not recorded in VC65, including Gilling West, Scotch Corner (SW), Marrick Moor, Reeth High Moor and Muker Moor. Another session has been arranged commencing on 1 July 2013 and finishing at Nosterfield LNR for the VC65 YNU Excursion meeting on 6 July 2013.

References

Anon (2007) Report on Species and Habitats Review. JNCC, Peterborough viewed online at http://jncc.defra.gov.uk/PDF/UKBAP_Species-HabitatsReview-2007.pdf

Anon (2011) UK Priority Habitat Descriptions. JNCC Peterborough viewed online at http://jncc.defra.gov.uk/PDF/UKBAP_PriorityHabitatDesc-Rev2011.pdf

Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D and Yeo M. (2004) *An Illustrated Guide*

to Britsih Upland Vegetation. JNCC, Peterborough.
Grime, P.J., Hodgson, J.G. and Hunt, R. (2007) *Comparative Plant Ecology.* Revised 2nd edition. Castlepoint Press, Dalbeatie
Hill, M.O., Preston, C.D. and Roy, D.B. (2004) *Plantatt – Attributes of British and Irish Plants:Status, Size, Life History, Geography and Habitats.* Centre for Ecology and Hydrology, Biological Records Centre, Wallingford.
Hooftman, D.A.P. and Bullock, J.M. (2012) Mapping to inform conservation: A case study of changes in semi-natural habitats and their connectivity over 70 years. *Biological Conservation* 145, 30-38.
Redfern, M. (2011) *Plant Galls.* Collins New Naturalist series 117, London.
Rodwell, J.S. (1991) *British Plant Communities. 1 Woodlands and Scrub*. Cambridge University Press, Cambridge.
Russ, J. (2012) *British Bat Calls – a guide to species identification*. Pelagic Publishing, Exeter.

Website consulted:
Bedfordshire NH Society: http://www.bnhs.co.uk/focuson/grabagridref/html/index.htm

Botanical Report for 2012

Phyl Abbott
email: phyl.a@virgin.net

First: corrections to last year's report. Mike Wilcox informs me that the record of *Juncus x diffusus* at Terrington Moor in VC62 is incorrect. Vince Jones sent the specimen to him and he redetermined the plant as *Juncus effusus*. I am advised that the record of "*Luzula x danica* – *Luzula multiflora* ssp. *multiflora x Luzula multiflora* ssp. *congesta*" found in VC65 should read: "*Luzula multiflora* ssp. *multiflora* x ssp. *congesta*, M. Wilcox, B.A.Tregale & L. Robinson, (det. M.Wilcox, 20/07/2011, pending further study)." The name *Luzula x danica* would be used if the taxon was treated at species level but, as we are treating plants at subspecies level, the name is incorrect and no other subspecies name has been published for the hybrid.

This year's weather has had dramatic effects on many of our plants. The trees and shrubs flowered prolifically in spring and were beautiful. Due to the very frequent rain many plants grew much taller than usual. A most impressive sight in August was the mass of literally hundreds of Autumn Gentians *Gentianella amarella* in the YWT reserve at Ledsham Bank, some of which were a foot tall instead of their usual three or four inches.

Uncommon plants continue to be found throughout the County. It is good to know that the Lizard Orchid *Himantoglossum hircinum*, found in 2011 near Doncaster, has flowered again in 2012. Sea Aster *Aster tripolium* has been seen well inland on a salted road verge at Lelley. Royal Fern *Osmunda regalis* is gracing a pond outflow area near Guisborough and has also been re-recorded on Thorne Moors. *Myosotis x bollandica* (*M. stolonifera x M. secunda*), which was only recently identified in the Forest of Bowland, has now been found on the edge of a beck at Beamsley and also in Widdale and East Stonesdale.

Many alien plants have been recorded in 2012, a considerable number of which have appeared in Yorkshire only in the last decade. More details of these and of the interesting native plants can be seen in the lists which follow.

VC61 South-east Yorkshire

Taxon	Vernacular	Site	Grid ref	Recorder	Date	Notes
Geranium columbinum	Long-stalked Crane's-bill	Well Dale Plantation, Cowlam	SE9765	P.Nuttall	17.6.12	
Oenanthe fluviatilis	River Water-dropwort	Struncheon Hill	TA0750	R.Goulder	23.8.12	
Rumex maritimus	Golden Dock	Dry bed of Gipsy Race near Rudston	TA1067	P.J.Cook	18.7.12	
Aster tripolium	Sea Aster	Nuttles Lane, Lelley	TA2032	P.J.Cook	21.10.12	Road verge salt zone
Eleogiton fluitans	Floating Club-rush	Holderness Drain, Tickton Bridge	TA0742	R.Goulder	23.8.12	
Eleocharis uniglumis	Slender Spike-rush	Nunburnholme meadow	SE8447	P.J.Cook	15.6.12	
Arrhenatherum elatius var *bulbosum*	Onion Couch	Oxlands Dale, Huggate	SE8956	P.J.Cook	10.8.12	Unusual in CG4 grassland
Parapholis strigosa	Hard-grass	A1033 Hedon bypass	TA1927	P.J.Cook	18.10.12	Road verge salt zone

VC62 North-east Yorkshire

Taxon	Vernacular	Site	Grid ref	Recorder	Date	
Actaea spicata	Baneberry	Gilling, wood	SE6276	G.Smith	27.5.12	
Cynoglossum officinale	Houndstongue	Hutton Cor, pathside	SE7088	G.Smith	9.6.12	
Dactylorhiza praetermissa	Southern Marsh-orchid	Castle Howard arboretum	SE7069	G.Smith	6.6.12	
Daphne laureola	Spurge Laurel	Ashberry, wood edge	SE5784	G.Smith	16.3.12	
Daucus carota	Wild Carrot	Ampleforth, field edge	SE5877	G.Smith	19.8.12	
Erigeron acer	Blue Fleabane	Broughton, road edge	SE7771	G.Smith	8.9.12	
Gagea lutea	Yellow Star of Bethlehem	Nunnington riverbank	SE6794	G.Smith	31.3.12	
Genista anglica	Petty Whin	Hawnby Moor	SE5391	G.Smith	20.5.12	
Helleborus viridis	Green Hellebore	Ashberry, wood edge	SE5784	G.Smith	16.3.12	
Lithospermum officinale	Gromwell	Hinderley, wood edge	SE7570	G.Smith	8.9.12	
Ophrys apifera	Bee Orchid	Gilling, grassland	SE6075	G.Smith	24.6.12	
Ophrys insectifera	Fly Orchid	Hutton Cor Woods	SE7088	G.Smith	9.6.12	
Orchis ustulata	Burnt Orchid	Yatts Farm Grassland	SE8088	G.Smith	4.6.12	
Orobanche elatior	Knapweed Broomrape	Broughton, verge	SE7672	G.Smith	22.7.12	
Osmunda regalis	Royal Fern	Guisborough Moor, pond outflow	NZ636135	L.Winter	26.8.12	

Paris quadrifolia	Herb Paris	Gilling, wood	SE6276	G.Smith	27.5.12
Saxifraga granulata	Meadow Saxifrage	Ashberry, beck-side	SE5784	G.Smith	16.3.12
Saxifraga granulata	Meadow Saxifrage	Helmsley grass bank	SE6282	G.Smith	20.5.12
Silene noctiflora	Night-flowering Catchfly	Welburn, fiield edge	SE7167	G.Smith	16.10.12
Stellaria nemorum	Wood Stitchwort	Helmsley river-side	SE6282	G.Smith	26.5.12
Trifolium striatum	Knotted Clover	Hutton Cor pathside	SE7088	G.Smith	9.6.12

VC63 South-west Yorkshire

Taxon	**Vernacular**	**Site**	**Grid ref**	**Recorder**	**Date**
Calamagrostis canescens	Purple Small-reed	Thorne Moors	SE71	D.R.Grant	
Cladium mariscus	Great Fen-sedge	Thorne Moors	SE724156	D.R.Grant	
Myosoton aquaticum	Water Chickweed	Old Moor RSPB Reserve, stream to east	SE4201	D.R.Grant	
Hieracium cheriense	Cher Hawkweed	Dearne Valley Country Park	SE353068	D.R.Grant	
Hieracium fictum	Lacerate-leaved Hawkweed	Thorne Moors	SE71	D.R.Grant	
Osmunda regalis	Royal Fern	Thorne Moors	SE71	D.R.Grant	
Rubus anisacanthos	bramble	Millhouse Green	SE2002	D.R.Grant	
Rubus echinatus	bramble	Dearne Valley Country Park	SE353068	D.R.Grant	
Rubus incurvatiformis	bramble	Scammonden Reservoir	SE0416	Y.N.U. (D.R.Grant)	11.8.12
Rubus lindebergii	bramble	Scammonden Reservoir	SE0416	Y.N.U. (D.R.Grant)	11.8.12
Rubus scissus	bramble	Scammonden Reservoir	SE0416	Y.N.U. (D.R.Grant)	11.8.12
Rubus lanaticaulis	bramble	Scammonden Reservoir	SE0416	Y.N.U. (D.R.Grant)	11.8.12
Rubus rufescens	bramble	Birdwell Wood LNR	SE3401	D.R.Grant	
Ulex gallii	Western Gorse	Scammonden Reservoir	SE0416	Y.N.U. (D.R.Grant)	11.8.12
Utricularia minor	Lesser Bladderwort	Thorne Moors	SE720163	D.R.Grant	

VC64 Mid-west Yorkshire

Taxon	**Vernacular**	**Site**	**Grid ref**	**Recorder**	**Date**
Agrimonia procera	Fragrant Agrimony	Sherburn-in-Elmet, laneside	SE484323	C.S.V.Yeates	15.7.12
Anthriscus caucalis	Bur Chervil	Fairburn Ings RSPB Reserve, grassy bank	SE165473 1st record	P.P.Abbott	1.6.12

Carex ericetorum	Rare Spring-sedge	Ledsham Bank YWT reserve	SE461301	K.Walker		
Descurania sophia	Flixweed	Esholt water treatment works	SE102399	D.Broughton	27.5.12	
Descurania sophia	Flixweed	Knostrop water treatment works	SE324303	D.Broughton	15.7.12	
Diphasiastrum alpinum	Alpine Clubmoss	Ingleborough	SD739748	B.Burrow		
Dryopteris oreades	Mountain Male-fern	Fallfoot Cliffs	SD737745	B.Burrow		
Dryopteris submontana	Rigid Buckler-fern	South House Pavement	SD776744	Craven Cons. Group	30.5.12	
Epilobium x novae-civitatis		Baildon, waste ground	SE151380	B.A.Tregale det. M.Wilcox	12.8.12	
Festuca rubra ssp. *megastachys*	Red Fescue	Baildon, waste ground	SE151380	B.A.Tregale M.Wilcox det. M.Wilcox	12.8.12	
Fritillaria meleagris	Fritillary	Swinsty Reservoir	SE197527	B.N.Brown	20.4.12	
Geum macrophyllum x G. urbanum		Shiple Glen, pathside	SE130388	M.Wilcox	18.6.12	
Helleborus viridis	Green Hellebore	Collingham, woodland	SE374457	M.Smith	12.4.12	
Heracleum sphondylium x H.mantegazzianum		Great Preston, lake shore	SE404278	D.Broughton	10.6.12	
Hieracium lintonii	Linton's Hawkweed	Kilnsey quarry	SD967672	D.R.Grant T.Schofield		
Hieracium tricolorans	Three-coloured Hawkweed	Wharfe, Long Scar	SD786698	D.R.Grant T.Schofield		
Holcus x hybridus		Baildon, old mill site	SE152381	M.Wilcox C.Stace det. M.Wilcox	29.8.12	
Hypericum montanum	Pale St. John's-wort	Linton, pasture	SE386469	P.P.Abbott, M.Smith, D.Smith	22.5.12	
Myosotis stolonifera	Pale Forget-me-not	Beamsley, beck-side	SE092521	B.N.Brown	1.8.12	
Myosotis x bollandica		Beamsley, beck-side	SE092521	B.N.Brown M.Wilcox det. M.Wilcox	4.8.12	
Onopordum acanthium	Cotton Thistle	Linton, pasture	SE385468	P.P.Abbott	12.7.12	
Parentucellia viscosa	Yellow Bartsia	Knostrop, site of old power station	SE341302	D.Broughton	15.7.12	
Polystichum x bicknellii		Hackfall Wood	SE234772	B.N.Brown	13.11.11	

Potentilla crantzii	Alpine Cinquefoil	South House Pavement	SD775740	Craven Conservation Group	30.5.12	
Primula elatior	Oxlip	Yeadon, Engine Fields Reserve	SE205410	D.Broughton	6.4.12	
Ribes spicatum	Downy Currant	Nidd Gorge, woodland	SE328580	M.Canaway	8.10.11	
Thalictrum flavum	Common Mead-ow-rue	Harewood, roadside	SE346450	M.Smith	6.6.12	
Trifolium fragiferum	Strawberry Clover	Cawood	SE599378	J.Payne	8.8.12	
Trifolium fragiferum	Strawberry Clover	Fairburn Ings RSPB Reserve, pasture	SE453274	P.P.Abbott	14.8.12	
Vicia lutea	Yellow Vetch	Bolton Abbey, roundabout	SE070528	N.Vernon		

VC65 North-west Yorkshire

Taxon	Vernacular	Site	Grid ref	Recorder	Date	
Gymnocarpium robertianum	Limestone Fern	Combe Scar	SD6686	B.Burrow		
Gymnocarpium robertianum	Limestone Fern	wall, Cowgill Wold		M.Canaway	4.7.12	
Helleborus foetidus	Stinking Hellebore	Marfield Plantation	SE2082	L.Robinson M.Smith	8.3.12	
Hieracium calcaricola	Toothed Hawkweed	Cowgill Head	SD7888	B.Burrow		1st record
Hieracium crebridentiforme	Chapel-le-dale Hawkweed	Dodd Fell	SD8484	B.Burrow		1st record
Hieracium tricolorans	Three-coloured Hawkweed	Yorburgh Cliffs Burtersett	SD8888	B.Burrow		1st record
Hordelymus europaeus	Wood Barley	Deepdale Woods Barnard Castle	NZ0216	J.Durkin		
Hymenophyllum wilsonii	Wilson's Filmy Fern	Combe Scar	SD6686	B.Burrow		
Juncus alpino-articulatus	Alpine rush	Cronkley Pas-ture	NY8428	S.Hedley L.Robinson	1.9.12	
Malva neglecta	Dwarf Mallow	road verge near Cundall	SE4272	M.&E.Linney L.Robinson	29.7.12	
Myosotis x bollandica	*M.secunda x M.stolonifera*	Streamside, Widdale		M.Wilcox		1st record
Myosotis x bollandica	*M.secunda x M.stolonifera*	streamside, East Stonesdale		T.&E.Laurie L.Robinson		2nd record
Neottia nidus-avis	Bird's-nest Orchid	Deepdale Woods Barnard Castle	NZ0216	J.Durkin	1.7.12	
Polypodium x mantoniae	*P.vulgare x P.interjectum*	Cliffs, Wether Fell	SD8686	B.Burrow, D.Tennant det.B.Brown	12.8.12	
Pseudorchis albida	Small White Orchid	Leyburn quarry	SE1090	B.S.B.I.	14.7.12	

lix caprea ssp. hacelata	Goat Willow	Haw Bank near Carperby	SD9888	B.Burrow D.Tennant det.D.Meikle	3.5.12	
ıxifraga zoides	Yellow Saxifrage	Cronkley Pasture	NY8412	S.Hedley L.Robinson	1.9.12	
ıxifraga rculus	Marsh Saxifrage	tufa mound, Mud Beck, Arkengarthdale		E.&T.Laurie L.Robinson	3.8.12	
Dactylodenia 'ansii	*Gymnadenia borealis x Dactylorhiza maculata*	Fotherinholme SSSI	NY9804	A.Gendle	5.7.12	1st record

ien plants

xon	Vernacular	Site	Grid ref	Recorder	Date	VC
:er tataricum	Tartar Maple	Otley, riverside	SE200456	B.N.Brown	31.5.11	VC64
:onitum x perkianum	*A.napellus x A.variegatum*	Settle, road verge	SD813622	M.Canaway	14.6.12	VC64
grostis stellana	Highland Bent	Fagley. Woodhall quarry	SE196354	B.A.Tregale M.Wilcox	18.8.12	VC63
grostis stellana	Highland Bent	Baildon, waste ground	SE151380	M.Wilcox	1.8.12	VC64
grostis chnantha	African Bent	Baildon, Rockcliffe Ave.	SE153383	B.A.Tregale M.Wilcox	12.8.12	VC64
cea rosea	Hollyhock	Bradford, Queens Rd. pavement weed	SE167349	B.A.Tregale	24.6.12	VC63
nemone pronaria	Crown Anemone	Burley-in-Wharfedale, riverbank	SE165473	D.A.Broughton	13.3.12	VC64
nisantha andra	Great Brome	Fagley, Woodhall quarry	SE196354	B.A.Tregale M.Wilcox	4.6.12	VC63
dens ferulifolia	Fern-leaved Beggarticks	Great Broughton, base of wall	NZ547063	V.Jones	30.8.12	VC62
achyglottis x bar "Sunshine"	*B.laxifolia x B.compacta*	Bingley, canal bank	SE107395	Bradford Botany Group	11.7.12	VC64
assica juncea	Chinese Mustard	Fagley, Woodhall quarry	SE196354	B.A.Tregale M.Wilcox	10.6.12	VC63
uddleja obosa	Orange-ball-tree	Coatham Marsh, rough grassland	NZ584246	V.Jones W.Thompson	25.5.12	VC62
alceolaria tegrifolia	Slipperwort	Bradford, Cater Street, courtyard	SE167331	M.Wilcox	7.8.12	VC63
ampanula punculoides	Creeping Bellflower	Grangetown, road verge	NZ577240	V.Jones M.Yates	3.8.12	VC62
arex comans		Bingley, Bell Bank	SE103390	Yorkshire Fern Group	10.3.12	VC63
haenomeles ponica	Japanese Quince	Great Preston, Woodend	SE403278	D.A.Broughton	10.6.12	VC64
onyza oribunda	Bilbao Fleabane	Esholt tip	SE178398	B.A.Tregale M.Wilcox	11.8.12	VC64

Conyza floribunda	Bilbao Fleabane	Bradford, Forster Court, waste ground	SE165332	M.Wilcox	4.9.12	VC6
Conyza floribunda	Bilbao Fleabane	Warrenby, road verge	NZ579250	V.Jones B.A.Tregale M.Wilcox	26.8.12	VC6
Conyza floribunda	Bilbao Fleabane	Knostrop sewage works	SE342303	D.A.Broughton	15.9.12	VC6
Cosmos bipinnatus	Mexican Aster	Coatham, Majuba Road, base of wall	NZ591250	V.Jones W.Thompson	25.6.12	VC6
Cotoneaster conspicuus	Tibetan Cotoneaster	Bradford, Church Bank, base of wall	SE169333	M.Wilcox	7.8.12	VC6
Cotoneaster lacteus	Late Cotoneaster	Baildon, waste ground	SE151380	M.Wilcox	12.7.12	VC6
Cotula alpina	Alpine Cotula	Roundhay, Park Lane, garden lawn	SE330390	J.Martin	1.7.12	VC6
Crataegus rhipidophylla	Large-sepalled Hawthorn	Knostrop, site of old power station	SE345303	D.A.Broughton	15.7.12	VC6
Cyrtomium fortunei	Fortune's Holly-fern	Hull, Westminster Avenue	TA123310	R. Middleton	14.8.12	VC6
Cyrtomium fortunei	Fortune's Holly-fern	Hull, museum garden wall	TA102288	R. Middleton	16.8.12	VC6
Dianthus barbatus	Sweet-william	Staintondale, disused railway	SE994983	V.Jones	1.8.12	VC6
Doronicum x excelsum	Harpur-Crewe's Leopard's-bane	Weeton, roadside	SE285468	B.N.Brown	19.5.12	VC6
Doronicum plantagineum	Plantain-leaved Leopard's-bane	Leeds Ring-road (Moortown)	SE295386	P.P.Abbott	20.5.12	VC6
Erysimum helveticum		Greengates, pavement weed	SE192371	M.Wilcox	7.7.12	VC6
Escholzia californica	Californian Poppy	Melbourne	SE759449	Hull Natural History Society	18.8.12	VC6
Euphorbia myrsinites		above Marske Sands, base of wall	NZ635228	V.Jones	10.9.12	VC6
Ficus carica	Fig	Hull, Humber Street	TA099283	R. Middleton	20.9.12	VC6
Galanthus plicatus	Pleated Snowdrop	Dean Grange Farm, track	SE236407	D.A.Broughton	8.4.12	VC6
Galanthus plicatus x G. elwesii		Eston Cemetery	NZ546197	J.Cox T.Millions D.Sills conf. V.Jones	6.3.12	VC6
Galinsoga parviflora	Gallant Soldier	Hull, Old Town area	TA 1028	R.Middleton	16.8.12	VC6
Geranium x cantabrigiense	*G,macrorrhizum x G,dalmaticum*	Horsforth	SE234387	D.A.Broughton	12.4.12	VC6
Geranium dalmaticum		Bingley, Charles Street	SE109343	B.A.Tregale M.Wilcox	7.7.12	VC6

elleborus gutifolius	Corsican Hellebore	Marske, The Headlands, base of wall	NZ636225	V.Jones	7.3.12	VC62
ordeum batum	Foxtail Barley	Kelleythorpe Industrial Estate	TA008569	R.Middleton	17.9.12	VC61
sminum diflorum	Winter Jasmine	Seamer, on stone wall	TA015838	V.Jones W.Thompson	8.8.12	VC62
mprocapnos ectabilis		Yeadon, old railway line	SE202408	D.A.Broughton	20.5.12	VC64
thraea ındestina	Purple Toothwort	Westlock, bank of R.Ure	SE355669	B.Morland	10.4.12	VC64
pidium ginicum	Least Pepperwort	Great Ayton, pavement	NZ561106	V.Jones	27.6.12	VC62
gustrum x caryi	*L.vulgare x L.ovalifolium*	Rawdon	SE220384	D.A.Broughton	11.3.12	VC64
ırcissus x chromus	*N.moschatus x N.cyclamineus*	Rawdon	SE234387	D.A.Broughton	12.4.12	VC64
onea lutea		Helmsley, Emslac Road, base of wall	SE612840	V.Jones	12.4.12	VC62
mphaea arliacea		South of Kirklevington, brickworks pool	NZ425081	V.Jones W.Thompson	2.8.12	VC62
mphaea arliacea		Kippax, lagoon by cycle path	SE406293	D.A.Broughton	8.7.12	VC64
teospermum cundum	Cape Daisy	South Gare,edge of breakwater	NZ556275	A.Bunn V.Jones	24.6.12	VC62
tasites albus	White Butterbur	Normanby, roadside	NZ541180	A.Bunn	6.3.12	VC62
uopsis stylosa	Caucasian Crosswort	High Hawkser, rough grassland	NZ927074	W.English V.Jones A.Ritson	17.5.12	VC62
ysalis ruviana	Cape Gooseberry	Knostrop, site of old power station	SE342303	D.A.Broughton	15.7.12	VC64
losella x olonifera	*P.officinarum x P.aurantiaca*	Saltaire, wall of canal lock	SE131382	M.Wilcox	29.6.11	VC63
atia angulata	Lawn Lobelia	Bingley, church-yard	SE105394	B.A.Tregale	11.7.12	VC64
imula x uhonicensis	*P.vulgaris x P.juliae*	Yeadon, Engine Fields Urban NR	SE205409	D.A.Broughton	6.4.12	VC64
ılmonaria bra	Red Lungwort	Ben Rhydding	SE137476	D.A.Broughton	7.5.12	VC64
xifraga mbalaria	Celandine Saxifrage	Northallerton, road verge	SE363930	V.Jones	3.5.12	VC62
illa sardensis	Lesser Glory-of-the-snow	Eston Cemetary	NZ546183	A.Bunn	11.3.12	VC62
dum kamts-aticum var. *lacombeanum*	Kamchatka Stonecrop	Cookridge, Mo-seley Bottom, steps into wood	SE244400	D.A.Broughton	14.6.12	VC64
necio aequidens	Narrow-leaved Ragwort	Kelleythorpe Industrial Estate	TA009570	R.Middleton	17.9.12	VC61

Stranvaesia davidiana	Stranvaesia	Adel, Leeds	SE279402	D.A.Broughton	5.4.12	VC6
Sutera cordata	Bacopa	Addingham, in grating	SE079497	N.Vernon	21.10.11	VC6
Sutera cordata	Bacopa	Osmotherley, Clack Lane, base of wall	SE455972	V.Jones	19.7.12	VC6
Symphytum asperum	Rough Comfrey	North Lees, roadside	SE298742	P.P.Abbott	25.6.12	VC6
Tanacetum macrophyllum	Rayed Tansy	Husthwaite, The Nookin, base of wall	SE518750	V.Jones W.Thompson	20.8.12	VC6
Viburnum rhytidophyllum	Wrinkled Viburnum	Bradford, Valley Road, wall	SE161344	M.Wilcox	10.3.12	VC6
Viburnum tinus	Laurustinus	Rawdon, wood-land	SE220380	D.A.Broughton	6.5.12	VC6

YNU Excursions 2013

Circular No. 880

Divisional Secretary VC63: Joyce Simmons, 16 Springfield Crescent, Kirk Smeaton, Pontefrac WF8 3LE Tel: 01977 620725 E-mail: joyce@gentian.plus.com

The VC63 excursion will be on **Saturday 18 May to Cromwell Bottom, near Brighouse**.

Maps:1:50000 Landranger sheet 104. 1:25000 Explorer sheet 288 Bradford and Huddersfiel

Meeting Place: Meet at 10.30 at Cromwell Bottom Local Nature Reserve car park (SE125224 From the M62 take exit 25 and follow the A644 to Brighouse and then the A6025 to Ellan About 1½ miles along this road look out for a blue and yellow sign 'Oils Well' outside Cromw House on the left. Turn down the lane just before the sign. The car park is on the left in 10 yds. Turn in under a height barrier.

Indoor Meeting: This will be in 'The Link' in Central Methodist Hall, Brighouse,+ at 16.0 This is next to the bus station and there is parking in a pay and display car park nearby: the is very little space at the hall. Enter 'The Link' through a glass door to the right of the ma building. Tea and coffee will be available. There will be a small charge to cover the cost hiring the hall.

The area: The Calder valley is steep-sided, with glacial deposits of gravels on its floor. Sar and gravel extraction continued here until the 1970s, leaving pools where osiers were grow for baskets, etc. Fly ash was dumped there, some of which was used in the construction the M62. Part of the site was used for landfill, which ended in the 1990s, but methane ven are still in use.

Since then the area has been landscaped into meadow, woodland and particularly interesting wet areas, some of which are alkaline as a result of the fly ash residues. This has resulted in a variety of habitats which are being actively managed to increase their biodiversity. Calderdale Council and Cromwell Bottom Wildlife Group look after the site.

There are several bodies of water here. The Calder and Hebble Navigation runs along the northern boundary, the River Calder meanders through, an old canal (now just a stream) runs to the south of the meadow and there are numerous ponds in the old gravel extraction area. Despite its history of industrial abuse, this area is developing diverse habitats which support a wide variety of species. There are notable plants here, such as Broad-leaved Helleborine *Epipactis helleborine*, Yellow Bird's-nest *Monotropa hypopitys*, Round-leaved Wintergreen *Pyrola rotundifolia* and Needle Spike-rush *Elocharis acicularis*. Breeding animals include Little Ringed Plover, Sedge Warbler, Kingfisher, Smooth and Palmate Newts and many dragonflies.

If time allows, members may wish to visit Elland Park Wood which clothes the south-facing steep valley side to the north of the A6025. It is mainly oak woodland, some of which is being managed as an oak coppice. Pendulous Sedge is found here and the abundant Bluebells *Hyacinthoides non-scripta* should be in flower for our visit.

There has been only one previous VC63 excursion to this 10km square, SE12; to Elland in 1984.

Hazards of the area: There are various water bodies – river, canal, lakes and ponds, and their banks vary in their solidity. Some paths have short steep sections.

Circular No. 881

Divisional secretary VC64: Terry Whitaker; 4 Crowtrees, Low Bentham Via Lancaster LA27EE Tel: 015242 62269 E-mail: t.whitaker1@btinternet.com

The VC64 meeting will be to **Grassington, Grass and Bastow Woods, SD9865 & SD9965, on Saturday 8 June**.

The YNU Moth Group is invited to trap on the Friday night - generators/batteries will be required because there is no power source on site.

Maps: 1:50,000 Outdoor Leisure 10 Yorkshire Dales
1.25,000. Explorer OL 002 (Yorkshire Dales - Southern and Western areas)

Meeting place: Park in the Grassington village car park or limited parking along Grass Wood Lane towards Conistone. Meet at 10:30 at the gate into the SE corner of the wood near SD988649.

Indoor meeting: 16: 00 Grassington (to be arranged).

The Area: Grass Wood is a botanically rich Ash woodland occupying an area of Carboniferous Limestone in Wharfedale, one mile west of Grassington. The wood measures 88ha. Whilst the natural woodland of the lower slopes is Ash-Hazel this does naturally gradually give way to birch higher up.

The site is notified as a SSSI due to its floral assemblage associated with limestone pavements, screes and grasslands. This includes Angular Solomon's-seal *Polygonatum odoratum*, Blue Moor-grass *Sesleria caerulea*, and Bloody Crane's-bill *Geranium sanguineum*, Spring Sandwort *Minuartia verna*, Common Rock-rose *Helianthemum nummularium* and Limestone Bedstraw *Galium sterneri*. Other rare plants, such as Spring Cinquefoil *Potentilla tabernaemontani*, Alpine Cinquefoil *P. crantzii*, Moonwort *Botrychium lunaria* and Dwarf Milkwort *Polygala amarella*, are present in calcareous areas and there are extensive areas with Common Rock-rose, Primrose *Primula vulgaris* and Bird's-eye Primrose *P. farinosa,* while the nationally declining Mountain Pansy *Viola lutea* does well at present in Bastow Wood, particularly in the open area near the dewpond. Moonwort, which was known in the same area, has not been seen there since 1987. Bastow is very close to the open calcareous grassland of Lea Green and Conistone Dib meadows and good for Autumn Gentian *Gentianella amarella* and Field Gentian *G. campestris*.

The woodland is believed to be ancient in origin and its original composition is thought to have been Ash *Fraxinus excelsior,* Wych Elm *Ulmus glabra* and oak with an understorey of Hazel *Corylus avellana*. The ground flora beneath the woodland canopy is rich and varied and includes many ancient woodland indicator plants such as Dog's Mercury *Mercurialis perennis*, Bluebell *Hyacinthoides non-scripta*, Herb Paris *Paris quadrifolia*, Barren Strawberry *Potentilla sterilis*, Goldilocks Buttercup *Ranunculus auricomus* and Hairy St John's-wort *Hypericum hirsutum*.

The wood is also a noted location for its fauna. There are notable records of invertebrate findings including Northern Brown Argus butterfly and other Lepidoptera such as Cistus Forester, Barred Tooth-striped Moth and Least Minor. There are similar amounts of interest for all amateur naturalists whatever their preference: flora, fauna or fungi.

As well as natural history, there is also a wealth of cultural history within the woods. There are two scheduled ancient monuments and other archaeological remains.

A key to driving past and current management has been the lack of regeneration within the woodland element of the site, itself probably the scarcest major habitat in the Dales. The area has three main notified interests, broad-leaved woodland, limestone pavement and calcareous grassland and, whilst these have all been given notional units, the site is effectively a single management block which results in difficulty in management regimes and potential conflicts in objectives. The planting of conifers and hardwoods has taken place throughout the wood from 1815 to 1969 and these trees are gradually being removed. The main management aim is to return the wood to a predominantly Ash woodland by the removal of the introduced Beech, Sycamore and conifers (larches and spruces). This is planned to occur over a period of years and some species are now notable landscape features, especially the mature Beech. Agri-environment schemes have sought to augment this management with a view to restoring grazing once woodland regeneration is underway. As a result, management over the last several years has led to small exclosures followed by total stock removal. However, even that failed to result in the establishment of new saplings, probably caused by Rabbit and Roe Deer grazing. The small areas of pavement which generally benefit from light are becoming scrubbed up with birch; Bracken *Pteridium aquilinum* is also spreading. It is also suggested that the sward of the more open areas higher up has become rank and is reducing the botanical interests.

The wood is owned by the Yorkshire Wildlife Trust but largely managed by a dedicated band

f local volunteers, with YWT staff only stepping in where necessary. These volunteers carry ut the laborious tasks such as coppicing and clearing up after timber contractors have felled r removed conifers. They also carry out vital wardening and recording on site at various mes during the week or year as necessary.

he wood is well loved by locals and visitors alike. It is one of the larger woodlands within he YDNP. Access for the YNU meeting will essentially cover the whole Grass Woods reserve cluding Bastow Wood to the north and east. For those members with restricted mobility he footpath through Lower Grass Wood above the River Wharfe is less challenging but still ffers plenty to see.

azards of the area: This site is as accessible as such a rocky woodland can be. There is ways risk from tripping and falling, especially on steep slopes. Please take reasonable care t all times and wear appropriate clothing. Any children in the party must be supervised by parent or guardian at all times.

Circular No. 882

ivisional secretary VC65: Terry Whitaker; 4 Crowtrees, Low Bentham Via Lancaster LA27EE el: 015242 62269 E-mail: t.whitaker1@btinternet.com

he VC65 meeting will be to **Nosterfield NR on Saturday 6 July**

he YNU Moth Group is invited to trap on the Friday night; generators/batteries will be equired because there is no power source on site.

laps: 1:50000 Landranger sheets 299 and 302; 1:25000 Explorer sheets for SE27 and SE28

leeting place: Meet at 10.30 and park in the reserve car park, off Moor Lane (SE278795).

ndoor meeting: At the reserve interpretation building at 16.00. A contribution to tea and akes will be requested.

he Area: Nosterfield Nature Reserve lies close to the River Ure and is a former sand and ravel (fluvio-glacial) quarry, over Magnesian Limestone. It is predominantly wet grassland, nanaged mainly for breeding and wintering waders and waterfowl; with particular focus on reeding Redshank and Shoveler.

uarrying has taken place in the area since the Neolithic, principally for sand, gravel and lagnesian Limestone; however, excavation of sand and gravel started over the reserve area n the mid-1950s, with a sufficient area of standing water created to attract enough birds to nake the area well watched by the mid/late 1970s. Mineral extraction ceased in 1996/97, eaving behind mainly grassland, two large lakes and former silt lagoons.

n total the reserve is a little over 150 acres (60ha); it is predominantly grazed grassland djoining two significant permanent water bodies and two smaller former silt lagoons. owever, water levels over the bulk of the site fluctuate in line with groundwater and surface ater influences, ranging by up to three metres or more in a year; therefore permanent ater is approximately seven hectares but can exceed well over 25ha in a wet year. As a result here are extensive drawdown zones, in which seasonally flooded scrapes have been created

to a regularly changing water edge. At the northern end (SE28) of the reserve >1,000r of seasonally flooded 'foot-drains' and 15 ponds were formed in autumn 2010; these ar establishing well but have currently not been surveyed.

The silt lagoons are largely isolated from the groundwater, being 'sealed' by the fine sediments from the silting process; they therefore have much more stable water-levels an quite different flora and fauna, compared with the water bodies over the limestone.

Whilst much of the area was 'restored' to improved grassland during the 1980s, the fin stages were largely left for vegetation to naturally regenerate and stand as an interestin example of that process on a post-mineral extraction site. The grazed areas are principall managed with breeding Redshank in mind; as this bird dislikes the presence of livestock, th area is largely ungrazed until after a hay crop is removed in mid-July. The taking of haylage fo over ten years has assisted in nutrient reduction; extensive stands of Yellow Rattle *Rhinanthu minor*, together with increasing botanical diversity including numerous Bee Orchids *Ophry apifera*, bear witness to this.

The site is particularly well known for birds, with around 150 species per annum bein recorded. It is something of an inland migration 'hot spot', with generally over 20 wade species being recorded each year, including breeding ones, from Lapwing to Avocet. The sit also supports good populations of common farmland birds, as well as some conservatio priority species such as Corn Bunting. In total over 225 full bird species (excluding escape etc.) have been recorded.

Entomologically, the site has been fairly well recorded in certain orders, with over 20 specie of butterflies (including Wall and White-letter Hairstreak) recorded in most years. Over 45 moths and a total of over 1,500 insects has been recorded to date. However, there are sti significant gaps in our knowledge; notably groups and orders such as arachnids.

Botanically the site is probably most notable for its draw-down zone plants such as Mudwor *Limosella aquatica* and those thriving on thinner gravelly soils such as Blue Fleabane *Erigero acris*; however, the wider species-rich grasslands are re-establishing well, with impressiv drifts of plants such as eyebrights *Euphrasia* spp. and Bird's-foot-trefoil *Lotus corniculatu* becoming increasingly apparent. The site now also supports seven species of orchid.

The reserve is fully owned and managed by the Lower Ure Conservation Trust (formed i 1997); however, members of the Trust oversaw the quarry's final 'restoration' process in th mid-1990s, having known the site well since the mid-1970s and early 1980s. Access for th YNU meeting will essentially cover the whole reserve; however, there may be some zonin and time constraints, principally to minimise disturbance to birds.

Hazards of the area: There is always risk from tripping and falling. Please take reasonabl care at all times, and wear appropriate clothing. Any children in the party must be supervise by a parent or guardian at all times and take care especially near to areas of open wate There will also be some specific safety restrictions, such as adjoining the silt lagoon pond (quicksand).

Previous YNU visits to the area: May 1935 Tanfield (Excursion 293) Reports: *The Naturalist* Suppl. (1935) 60: 189-191.

Circular No. 883

ivisional secretary VC61: Sarah White, Yonder Cottage, Ashford Hill, Thatcham, Berkshire, G19 8AX. Tel: 01635 268442 Email: sarahpriest656@btinternet.com

he VC61 Meeting will be held on **Saturday 20 July at Danes Dyke**.

laps: 1:50 000 Landranger Sheet: 101 Scarborough
1:25 000 Explorer Sheet: 301 Scarborough, Bridlington and Flamborough Head.

leeting Place: We will meet at 10.30 in the car park of the Danes Dyke Local Nature eserve, TA215694. The reserve and car park are signposted from the B1255 Bridlington to amborough road.

here is a good car park (for which there is a charge), a small café and toilets.

he Marine and Coastal Section will be meeting at 8.30 for a morning shore survey before ›ining the main excursion for the rest of the day.

ea and Meeting: This will be at 16.30 in the covered area adjacent to the café. The café has indly agreed to stay open to enable us to buy refreshments for the meeting, so please do atronise them.

he Area: Our visit is to the Danes Dyke Local Nature Reserve, which lies on the Flamborough eadland. This reserve, which is managed by East Riding Council, is the southern portion of n ancient ditch and bank earthwork which runs north to south across the headland, about km from its easterly tip, between Cat Nab on Bempton Cliffs in the north and Danes Dyke ı the south.

he reserve is a deep wooded ravine with a stream running through it and comprises the ıost extensive area of woodland on the headland. There is a good network of short circular /oodland paths (some quite steep), a cliff top path and an access track to the dramatic ɔcky beach. The extent of woodland, sheltered, damp and steep-sided, in an area with little /oodland habitat, together with the importance of the adjacent rocky intertidal area and liffs, makes the site of considerable local wildlife interest.

lamborough Head as a whole is designated Heritage Coast and includes several Sites of pecial Scientific Interest (SSSIs) and a European Marine Site. It is part of a 'No-take Zone', the rst such designation on the east coast, in which methods of fishing and extraction of natural ıaterials are prohibited in order to protect marine wildlife and safeguard local fish stocks. is also a geological SSSI for its spectacular chalk cliffs, a Special Protection Area (SPA) for s breeding coastal birds and a Special Area of Conservation (SAC) for chalk reef and caves.

anes Dyke Local Nature Reserve acquires its name from the ancient ditch and bank arthwork, which runs through the reserve. It consists of two constructed features, a flat-ɔpped bank and a west-facing ditch. The bank was constructed from earth, stacked turfs and halk rubble, much of which would have come from the ditch. Undoubtedly constructed as a efensive feature, it would have posed a formidable barrier, topped with a wooden palisade

fence. Although no exact date has been given to its construction, comparisons with othe post Roman earthworks of a similar size have been made, in particular with Aberford Dyke in the West Riding, which has been dated back to the Dark Ages. Danes Dyke is a Schedule Ancient Monument of national importance.

In recent years adjacent agricultural land has been included in a Countryside Stewardshi Scheme resulting in wider field margins at the edges of the fields and many new hedges hav been planted all over the Headland.

Hazards of the Area:

1. Paths in the woodland are steep in places and may be slippery if wet.
2. Care needs to be taken on the foreshore as it is rough and rocky.
3. Low Water is at 9.00: HIGH WATER IS AT 3.20pm. WE MUST BE OFF THE SHORE WEL BEFORE THIS AS THE SEA COMES RIGHT UP TO THE BOTTOM OF THE CLIFFS.

Reference: A useful introduction to the Reserve, and a map, is at www.danesdyke.com/

Circular No. 884

Divisional secretary VC62: Mick Carroll, 10 Crofts Avenue, Pickering, North Yorkshire, YO18 7HP. Tel: 01751 476550 Email: mickcarroll47@btinternet.com

The VC62 Meeting will be held on **Saturday 10 August at May Moss & Langdale Forest**.

Maps: 1:50 000 Landranger Sheet: 94
1:25 000 Explorer Sheet: OL27

Meeting Place: Meet promptly at 10.00 at the entrance to RAF Fylingdales and May Mos (SE856969) in the vehicle compound by the gate. If coming from Scarborough, use the wes side road and head up the Blakey Rigg road to the Grey Stones area. Please note that I hav permission to take YNU and associated members through a security area, so please be o time to take advantage of this concession.

Tea and Meeting: This will start between 16.00 and 16.30 in Langdale Village Hall, opposit Howden Farm (SE939912), where the ladies of Langdale Valley (who are renowned for thei cakes!) will provide refreshments.

The Area: Part of the area is within the North Yorkshire Moors SSSI, designated for it heather moorland, mire and associated upland bird communities. Some of the heathe moorland has been unmanaged since the early 1960s. As well as the disused Fylingdale site, where there will be an opportunity to look at some of the species returning, a variet of forestry plantation habitats, including clear-felled and regenerating areas, is present. Fo those interested Brian Walker, formerly the Forestry Commission's Wildlife Officer in Nort Yorkshire and the Tees Valley, will be with us to explain about the hydrology monitoring o May Moss and the restoration work. In addition, the adjacent old 'Radhaz' site gives adde interest to the area.

Book review

ıe Three-Legged Society by Ian D. Hodkinson and Allan Steward. Pp. 110 (+ 26 pp. with 67 ›lour & b/w photographs). Centre for North-West Regional Studies, Lancaster University.)12. £14.95, paperback. Available from: Christine Wilkinson, CNWRS, Fylde College, ıncaster University LA1 4YF or e-mail: wilkinson@lancaster.ac.uk

ıis well produced and illuminating book traces the lives of the Westmorland naturalists George abler (1839-1910), James Martindale Barnes (1814-1890) and Joseph Anthony Martindale 837-1914), three close friends who constituted 'The Three-Legged Society'. Although alwarts of Lake District natural history, particularly botany, they extended their studies to ›rkshire. Those interested in the early issues of *The Naturalist* will no doubt be familiar with the ‹tensive published work of Stabler and Martindale in 1879-1902 and 1868-1902 respectively.

ıese three remarkable naturalists not only spent a considerable time in the field, their ‹cursions being meticulously planned ahead and reviewed on completion, but there is a ›luminous correspondence between them. A field excursion may well involve them in a 30 n walk or an overnight stay. In the words of the authors these "three naturalists collectively ovide a fascinating study of the developing role of the gifted and committed 'amateur' in the evelopment of Natural History during the Victorian era...making highly significant and often ıiquely original contributions to several rapidly developing areas of the Natural Sciences". owever, these naturalists did not work in isolation and were instrumental in reviving the aning natural history section of the Kendal Literary and Scientific Institution by establishing 1868, under the auspices of the parent society, the Kendal and District Microscopical and atural History Association; although the latter wound down in 1880, the Kendal Natural story Society was established in 1885, Stabler and Martindale taking a very active role in ; success, the latter for example taking over the editorship of The Westmorland Natural story Record. A further indication of their involvement and the esteem in which they were ld beyond the county boundaries can be gained from their many correspondents, such Richard Spruce and Alfred Russel Wallace, and their attendance at field meetings, the NU recorder for the one held at Sedbergh noting "...the spirit of fellowship in science was stered by the presence of the Kendal naturalists...with their cryptogamic specialists, Messrs artindale and Stabler, famous for their painstaking, original labours amid the Bryophytes ıd Lichens, which added not a little open-air instruction to the other pleasures of the day".

espite its relatively slim size, this book is packed with biographical detail; it reads like a 'ho's Who of late 19th Century British cryptogamic botanists, the wealth of information ›ly supported by an extensive bibliography, but unfortunately not by the index – for though the latter is a fair reflection of the book's contents, it is far from exhaustive and any personalities and localities, for example, mentioned in the text are inadequately oss-referenced. Despite this shortcoming, there is so much to be admired in this work: ›t only will YNU members be, at least, interested in the Yorkshire connections, but a much ider audience will be enthralled by the contents. The authors and publishers are to be ›ngratulated on this biographical record which provides a fitting testimony to these naturalists.

3. The large and valuable collections of these three naturalists, housed in Kendal Museum, ıve been catalogued and the resulting databases are accessible via a free CD which ›mplements the above-reviewed book; this can be ordered from Kendal Museum, Station oad, Kendal LA9 6BT or e-mail: info@kendalmuseum.org.uk or downloaded from the ebsite: http://www.kendalmuseum.org.uk

MRDS

Participate in two Yorkshire-wide Projects

The Yorkshire Flat Hedgehog Survey: Is Yorkshire 'bristling' with Hedgehogs, or are they getting 'thin on the ground' ?

Introduction – During 1990 and 1991 the Yorkshire Naturalists' Union and its affiliate societies undertook a survey of Hedgehogs throughout Yorkshire. The results were quite revelation.

The prickly subject - Although this is one of the best recorded Yorkshire mammals wit most records coming from road casualties, the number and distribution of records tended t reflect the concentrations and enthusiasm of recorders. Dr Pat Morris of the Mammal Societ devised a standardised transect method in which car passengers recorded Hedgehog roa casualties from July to September in measured transects. These were of at least 20 miles o A, B or C roads in daylight and in dry conditions (the transects were not to be repeated in les than 30 days). Expressing the results as Hedgehogs per 100 miles, this showed pronounce regional differences with fewer in the south-west and greatest numbers in the north-east.

The prickly results – In the 1990-91 survey Yorkshire naturalists undertook 145 transec journeys of at least 20 miles, travelling 4,915 miles and encountering 342 Hedgeho casualties. This gave a mean density of 6.9 Hedgehogs per 100 miles.

Regional differences - Splitting Yorkshire into distinct geographical regions showed smalle numbers in the south and west (.06 in the Southern Pennines, 3.8 in lowland South Yorkshire larger numbers in central areas (10.8 in the Vale of York) and greatest numbers in the eas (12.58 on the Wolds).

The deadly school holidays - By only surveying through the mid-summer period whe Hedgehogs are most numerous and most active, major seasonal differences are avoidec However, within this three month period, peaks in casualty rates coincided with a) th commencement of school holidays, b) a fortnight later the mid-holiday turnover and the c) the August Bank Holiday weekend). All these events generate nocturnal journeys by peopl travelling to and from holiday venues.

Monitoring the changes - Recently, various national surveys have indicated a catastrophic crash in Hedgehog numbers to the extent that the Hedgehog is categorised under the NER Act 2006 as a 'Species of Principal Importance' for biodiversity ... So 20+ years on, let's repeat the Yorkshire survey and look at the changes in Hedgehog populations within the Yorkshire landscapes ... Are Hedgehog road casualties getting thinner on the ground?

Please download the survey form and accompanying instructions from the Mammals Sectio of the YNU Website and join in with the project during July, August and September.

WARNING: For reasons of safety, this project is **for passengers only** and **not** for drivers.

Colin Howes (YNU Mammal Recorder)
Email: colinhowes@blueyonder.co.uk

ɜrasitism of *Coleophora serratella*

ɒleophora serratella is a widespread insect in Yorkshire and is most easily found, as a late-star case-bearing larva, on birch leaves in early summer (see Plate IX, centre pages). The rvae are heavily predated by parasitic hymenoptera and I will be collecting cases during ne and July 2013 to measure the extent of the parasitism and the species involved.

vould be grateful if YNU members would send me any cases that they find on their local rch trees. Samples should be sent to the address below. The little mint tins sold by Costa ɒffee are ideal containers for posting the specimens. The exact location and date of llection should be included. All emerging moths will be released into birch woodland but e parasitoids will be kept for identification and confirmation by experts. I hope to publish e results and will credit everyone who sends specimens. Please email me immediately if u think you can help.

ɘrek Parkinson, 11 Crow Tree Close, Baildon, Shipley, West Yorkshire, BD17 6JH.
nail: derekparkinson@blueyonder.co.uk

YNU Notices

ıe Yorkshire Dales Environment Network

ıe Yorkshire Dales Environment Network (YDEN) comprises more than 25 organisations volved in the care and management of the Yorkshire Dales. YDEN's mission is to increase e strength and breadth of communication and collaboration between its members, ɜding to more effective use of a diverse range of skills and resources. The network includes search scientists at the University of Leeds (Biology, Geography, Earth and Environment), ɒdies responsible for the Yorkshire Dales environment (e.g. the Yorkshire Dales National rk Authority, the Environment Agency, Natural England and the National Trust) and a range stakeholders from wildlife conservation to agricultural interests. The establishment of ɒEN is now supported by a National Environment Research Council Knowledge Exchange ant which funds its coordinator, Dr. Anita Glover (University of Leeds), with match in-nd funding from member organisations. For more information, please contact Anita via n.glover@leeds.ac.uk

ɒrrection from *The Naturalist* 1081

ıe photographer of the Broad-leaved Helleborine in Doncaster (Plate V) was Michael ow.

erek Yalden

ıllowing the untimely death of Derek Yalden earlier this year, there will be a memorial ent to celebrate his life and achievements on the afternoon of Saturday 13 July at the ıiversity of Manchester.

you would like to attend or contribute a brief writen tribute to Derek, or for further details the event, please contact: p.morris5@btinternet.com

YNU Calendar April-August 2013

Apr	28	Marine and Coastal Section Shore Thing Survey. Robin Hood's Bay NZ953048 10.30 – 13:30.
May	1	Training Day - University of Leeds Students - Basic Field Skills for University of Leeds students. St Chad's Parish Centre from 9:30. If you are willing to tutor a small group please contact Terry Crawford on 01904 780849.
	4	Bryology Section Field Meeting Meet at 10.00 in Cronkley, on the A6277 at NY867298.
	11	Conchological and Freshwater Ecology Field Meeting Meet at 10.30 in the small car park near the bridge, Ings Lane, Low Bradley. Grid reference: SE001483.
	18	**VC63 Excursion Cromwell Bottom**, near Elland. Car park SE125224. 10.30.
	25	Botanical Field Meeting VC63 Austerfield, nr Doncaster. Meet at the roadside at SK660953 at 10.30 Note: This date is shown incorrectly in the Member's Card and in *The Naturalist* 1081.
Jun	1	Freshwater Ecology Section Meeting VC64 - Malham Tarn. Meet at 10.30 (SD 894658).
	8	**VC64 Excursion Grassington**, Grass & Bastow Woods, SD9865 and SD9965. 10.30.
	14	YNU Festival of Ecology - Scarborough Spa. Ecological activities and displays from 10.00-16.00 on Friday and Saturday in Scarborough Spa and the surrounding area. See http://ynu.org.uk/festivalofecology for details.
	14	Botanical Field Meeting VC61 Fordon. Meet at the roadside at TA055751. 10.30 – 13.00.
	15	YNU Festival of Ecology Scarborough Spa. 10.00 – 16:00 as above.
	21	24 hour Bioblitz in Whitby organised by OPAL. Contact Sarah West via sarah.west@ york.ac.uk or see http://whitbynaturalists.co.uk/WNBioblitz/index.htm
	21	Marine and Coastal Section shore survey: Saltwick Bay (Whitby Bioblitz) 19.00 – 21.00.
	22	24 hour Bioblitz in Whitby organised by OPAL - see above.
	22	Marine and Coastal Section shore survey: East Pier Whitby (Whitby Bioblitz) 20.30 – 22.30.
	29	Botanical Field Meeting VC64 Winskill. Meet at the roadside at SD836661. 10.30.
Jul	6	**VC65 Excursion West Tanfield/Nosterfield**, Nosterfield Nature Reserve SE2779. 10.30.
	6	Brimham BioBlitz - see http://www.bnhc.org.uk/home.html and follow the links.
	12	Historical Section Meeting York Museum: refreshments and work in progress at 11.00.
	13	Botanical Field Meeting VC62 Sinnington. Meet in the village at SE744857.
	20	**VC61 Excursion Danes Dyke**, Flamborough. 10.30 – 11.30.
	20	Marine and Coastal Section Field Meeting - Danes Dyke, Flamborough. 10.30.
Aug	10	**VC62 Excursion May Moss and Langdale Forest**, North Yorkshire Moors. 10.00 – 15.00.
	24	Botanical Field Meeting VC65 Leyburn area. Meet on the roadside at SE105910.

Yorkshire Naturalists' Union

c/o NEYEDC, St William College, 5 College Street, York YO1 7JF
Tel: 01904 641631 Email: membership@ynu.org.uk
Website: www.ynu.org.uk
Registered Charity No. 224018

The Naturalist

tice to contributors

tributors should indicate whether they wish their manuscripts to be subjected to anonymous peer review. ther manuscripts will be reviewed by the Editorial Board who at their discretion may send them to third es for comment and advice.

inal articles should be submitted electronically as an MS Word document to Dr A. Millard at llard@leedsmet.ac.uk.

se see *The Naturalist Guide to Consistency* on p77 of *The Naturalist* 1079 and please **avoid** the wing:

- using tabs to tabulate information (please use MS Word table format or separate the column entries in a single row with commas and enter a paragraph mark at the end of the row).
- inserting any figures, graphs or plates into the text; indicate their proposed locations in the text and send as separate files.

d quality, high resolution images are very welcome and should be sent as .jpg files, with a separate MS d file containing the caption and name of the person to whom the image should be attributed.

ectronic submission is not possible, contributions should be sent to Dr. A. Millard, Woodland Villas, 86 helor Lane, Horsforth, Leeds LS18 5NF (Tel. 0113 258 2482)

tributors should ensure the accuracy of reference citations. The Editorial Board and Council accept no onsibility for opinions expressed by contributors.

y Dates:
issue - **14 February**; August issue - **14 June**; December issue - **14 October**

ISSN 0028-0771

Yorkshire Naturalists' Union

MIX
Paper from responsible sources
FSC www.fsc.org FSC® C012290

DUFFIELD digital
Printed by Duffield Digital
www.duffieldprinters.co.uk

The Naturalist

gust 2013
lume 138
mber 1083

Yorkshire Naturalists' Union

urnal of Natural History for the North of England

The Naturalist

Vol. 138 No. 1083 August 2013

Contents

An asterix* indicates a peer-reviewed paper

Front cover: Coupling Odalisque damselflies *Epallage fatime*. Vouvaris River, Lesbos, May 2011.

Back cover: *Upper* - *Sepsis* sp. Golden Acre Park, Leeds, September 2012.

Lower - Antlion. Genus not so far determined. Monasteraki, Lesbos, September 2011.

Photographs from the 'Scary but Beautiful' exhibition by *John Bowers* (see p122).

Yorkshire Naturalists' Union

The Naturalist

August 2013 Volume 138 Number 1083

ditorial

otography in *The Naturalist*

ery issue of *The Naturalist* has photographs on the front and rear covers and additionally 4 page centrefold of coloured plates. The centrefold is primarily intended for the ustrative material accompanying the articles in the issue but not all of the available space needed for that purpose in every issue. It was not needed for this issue and we have ken the opportunity to include some of the best photographs of Yorkshire wildlife from e YNU Flickr site (see Plate VI, centre pages). We intend to repeat this experiment from ne to time as opportunity arises. If you have some iconic photographs of Yorkshire ldlife that you think may be suitable for *The Naturalist*, either for the cover or the centre-read please put them onto the Flickr site. Suitable photographs should be at least 500 obytes in size.

On the occurrence of the nudibranch *Geitodoris planata* in the North Sea and its addition to the Yorkshire marine fauna, with a note on recent new species

D. E. Whittaker, Scarborough
email: dew.marine@hotmail.co.uk

Introduction

G. planata is a large nudibranch (see Plate I, centre pages) of similar size and appearance to the well-known Sea Lemon *Archidoris pseudoargus* and was first described, as *Doris planata,* by Alder & Hancock (1846) from a small, light-coloured specimen. In 1862, they described a large, dark-coloured, heavily blotched and apparently new nudibranch as *Doris testudinaria*, later declaring (in Jeffreys, 1867) that they had come to the conclusion that they were of the same species. These two descriptions by the same authors illustrate the extreme variation to be found in *G. planata*, particularly between younger and older individuals, and further emphasize the care required in examining younger stages which may be misidentified as the common Sea Lemon. Later descriptions by Thompson & Brown (1976 and 1984) and Picton & Morrow (1992) are brief and, although these authors state that the species is variable in colouration, none fully stresses nor describes the extreme colour variability as first demonstrated by the original descriptions of Alder & Hancock, and which could lead to misidentification.

Distribution

G. planata is common throughout the Mediterranean, along the French Atlantic coast and from there to the southern and western coasts of the British Isles. The British distribution and status of *Geitodoris* have hitherto been somewhat confused due to conflicting statements in the literature, the general opinion being that this species was confined to the south and west coasts of the British Isles and of low frequency. Thus, Thompson & Brown (1976) originally stated that it occurred "at various places around the British Isles, but chiefly ... on southwest coasts", though by their later monograph (1984) they had become aware of the two Scottish North Sea records from the east of Scotland by Dawson (1870) and Walton (1908), given by McKay & Smith (1979).

Later authors disregard these two old records from eastern Scotland and both Hayward & Ryland (1990) and Picton & Morrow (1994) state that this sea slug does not occur in the North Sea. What is certain, however, is that there have been, until recently, no other reports of *G. planata* from the North Sea since Walton's specimen from off Berwick in 1907. There are no records from Northumberland or Durham and, despite on-shore and off-shore collecting by the author since the early 1960s, this species has only recently been found.

In June 1999 *Geitodoris* was seen for the first time on the Netherlands coast by divers and by July 2001 was reported to be so numerous there that adults and egg ribbons could be seen on most dives, with individuals of an extraordinary size up to 12cm in length (Van

agt, 2001). It was seen for the first time in the German Bight in the summer of 2002 at idhafen Harbour in Heligoland (Schubert, 2002); these records suggest a recent ingress id expansion of the distribution of *Geitodoris* into the eastern waters of the southern orth Sea from the English Channel.

ie discovery of a large, 42mm long specimen of *G. planata* on the underside of a rock in i extensive pool on the upper shore at Jackson's Bay, Scarborough, on 15 June 2010 is, erefore, of great interest and extends its distribution to the eastern seaboard of the itish Isles. In overall appearance the specimen was handsomely coloured, the background ilour of the mantle was orange, inclining to a rich yellow around the extreme edge and ottled with light brown and a few bright chestnut-brown blotches. A primary specific iaracteristic of *G. planata* is a number of very pale star-shaped patches along each side of e mantle, each with a centrally placed large tubercle. This was extremely obvious in the iecimen and gave instant recognition of the find. This was further confirmed by :amination of the head, which possessed the lateral oral tentacles not found in Sea mon. The rhinophores were dark brown with white tips, similar to those of *Jorunna mentosa* but unlike those of Sea Lemon. No spots of brown pigment were evident on the iderside of the mantle, a feature which the literature states as being a specific iaracteristic.

vo further specimens were found in different pools at Burniston Bay on 10 May 2012: a iall specimen of 25mm total expanded length and a very large individual of 88mm total :panded length, alongside a large coiled ribbon of spawn. The mantle of the small iecimen was pale yellow with diffuse, pale brown blotches in an even, almost bilaterally mmetrical pattern, and was the first indication that it was possibly not Sea Lemon. The inophores were brownish but the star-shaped patterns of acid glands on the sides of the antle could only be discerned under a lens. The underside of the body, including both the antle and the foot, was light yellow and minute points of brown pigment were scattered ound the underside of the mantle.

ie very large specimen greatly exceeded the maximum length given in the above erature but was still very much smaller than the giant specimens from the Dutch coast ited above. Its appearance was unattractive, of sombre greys and browns with blackish otches on the centre of the mantle towards the circle of gills; the epidermis within the gill rcle and surrounding the anus was also blackish. Two gill plumes were diseased, being unted and swollen, but no parasites were found to account for this malformation. The ar-shaped patches were obvious and numerous along both sides of the mantle, with lditional ones on the front of the mantle below the rhinophores. A few spots of brown gment were present on the underside of the mantle and the protruding dorsal surface of e foot was streaked and spotted with pale brown pigment. This specimen, although much irker, closely resembled Alder & Hancock's 1862 specimen shown in the supplementary ilume of Elliot (1910 Part 8, Plate 1, fig.5). All three Yorkshire specimens were filmed and iotographed *in situ*.

Other recent biological changes and new species in Yorkshire waters

The appearance of this large nudibranch is the latest in a number of biological changes recorded during the ongoing Yorkshire marine biodiversity survey commenced in 1967 (Whittaker, 2012). Three additions to the littoral taxa of local rocky shores, where these species were unknown thirty years ago, and a reflection of their increased status in Yorkshire waters, include the Velvet Swimming-crab *Necora puber*, the isopod *Zenobiana prismatica* and the Prawn *Palaemon serratus*, while a particularly interesting strand-line find is that of the first Yorkshire occurrence of Japweed *Sargassum muticum*.

Biological changes in off-shore taxa include increasing numbers of Sea Bass *Dicentrarchus labrax* and Red Mullet *Mullus surmuletus*, and the first appearance in Yorkshire waters of Black-bellied Angler *Lophius budegassa* and two decapod crustaceans, Angular Crab *Goneplax rhomboides* and Wrinkled Swimming Crab *Liocarcinus corrugatus*.

Velvet Swimming-crab *Necora puber*

This was formerly rare along the entire north-east coast, including the Yorkshire area. It was rarely seen by commercial fishermen and was not present on the shore, where the dominant crab was the Green Shore Crab *Carcinus maenas*. In 1967, Scarborough crab and lobster fishermen were specifically requested by the author to bring in specimens of this crab for display in newly-established marine aquaria at the Natural History Museum, but it was then so rare that none could be obtained. Odd specimens began to be increasingly returned by the fishing fleet but it was not until the early 1980s that the first occurrence of Velvet Swimming-crab was recorded from the Yorkshire shore, at Burniston Bay near Scarborough. Throughout that decade the numbers increased exponentially with such large numbers eventually being taken in crab pots and gill nets that a targeted Yorkshire fishery for the species began in the early 1990s with the crabs being exported to the continent, by which time it had also become a well-established inhabitant of the Yorkshire littoral zone. For a period in the late 1990s, some Scarborough in-shore trawlers were reporting that the crabs were so prolific in certain areas, particularly towards the south end of Filey Bay and towards Flamborough Head, that they had become a nuisance to fishing operations and were causing the boats to move elsewhere to avoid them. In the aftermath of easterly gales in March 2013, inestimable numbers of Velvet Swimming-crab were driven ashore at Fraisthorpe. This dramatic change has seen it become the dominant crab in shore pools along the Yorkshire coast, with Green Shore Crab occurring mainly in the upper levels of the shore and the harbours of the coast (pers. obs.).

Zenobiana prismatica

This is a small, unmistakable isopod with a parallel-sided body, short stout antennae and a rounded pleotelson, growing to a length of 14mm. Its distribution is Lusitanian, from the Mediterranean, Spain and Portugal extending north to the south-west of the British Isles and along the west coast to the Clyde sea. Its British status is described as rare, and with no distribution into the North Sea (Naylor, 1972; Haywood & Ryland, 1990). Because of this supposed rarity the species is not included in the many recently published popular guides

the marine life of British shores. Given this apparent distribution, records of its occurrence within the North Sea are of great interest.

The first notice of *Z. prismatica* on the Yorkshire coast is given by Bird & Morris (1992) and it has subsequently been found to be common amongst algae of the middle shore in the Yorkshire area, and can be easily collected (pers. obs.). However, earlier records are extant from the Northumberland coast, from 1976, when it was found to be common in *Corallina* in Druridge Bay (Sheader, 2000). Given the British status of *Zenobiana* in the literature, these records present a surprising and apparently anomalous occurrence within the North Sea and pre-date the increase in records of similar warm-water taxa in the central North Sea from the late 1970s, and the later discovery of *Z. prismatica* on the Yorkshire coast.

Zenobiana is known to inhabit a nest in crevices and holes in algae etc. (Naylor, 1974), and can be ,very rarely, encountered fully exposed and easily visible during normal collecting on the shore. Only three such specimens have been seen in Scarborough by the author, the first at Jackson's Bay, in September 2005, the second found fully exposed on the underside of a rock in the South Bay, on 17 February 2010, while another was found in the same area in March 2010. The individual was found, again fully exposed, on the underside of a boulder without any form of nest or concealing case. On the Northumberland coast it is reported from eulittoral fine sand dominated by lugworms *Arenicola* sp.

Common Prawn *Palaemon serratus*

This prawn (see Plate I, centre pages) was previously common only on the Welsh and Channel coasts and formerly very rare in the central North Sea; thus its status at Cullercoats was stated by Dr. H.O. Bull to be extremely rare, there having been only two finds there within a century (Cole, 1958). Since then there have been just a few unconfirmed reports (Moore, 2000). The records for the Yorkshire coast were just as meagre until the last decade, when specimens began to be taken both in the trawl and in crab pots, particularly to the south of Scarborough, in the traps of the Bridlington fishermen working along the extensive Holderness coast. The numbers being caught prompted some fishermen to consider the commercial deployment of special pots for their capture. It is now frequently seen off Scarborough and, as with Velvet Swimming-crab, this prawn has extended into the Yorkshire littoral zone and may be found in the rock pools of the shore (pers. obs.).

Japweed *Sargassum muticum*

Following extended easterly gales in March 2002, drifted fronds of Japweed were found at two Yorkshire localities 40 miles apart, Fraisthorpe and Robin Hoods' Bay, constituting the first records of this alien alga on the Yorkshire coast (Whittaker, unpublished). Japweed was first discovered as attached plants on the British coast at Bembridge, Isle of Wight, in 1971 (Farnham *et al.*, 1973) and subsequently spread along the south coast, eventually entering the southern North Sea and spreading along the coasts of Belgium, Holland, Germany, Sweden and southern Norway. On the English coast it has extended to Suffolk

and Norfolk (Critchley *et al*, 1983, Rueness, 1989). The drifted fronds found on consecutive days at Fraisthorpe and Robin Hood's Bay could conceivably, therefore, have originated from either the English or the European coastline of the southern North Sea; no attached plants have so far been discovered on the Yorkshire coast.

Change in status of Sea Bass *Dicentrarchus labrax*

This fish of southern distribution, previously regarded as uncommon in the North Sea (Wheeler, 1969), has been noted on the Yorkshire coast from the earliest days of biological recording but has never been present in any number, constituting only an occasional catch of usually small, single individuals in trawls and in summertime salmon-netting operations; similarly, the fish has been known as an occasional but unpredictable catch by Yorkshire shore anglers. With such a previously low frequency of capture, there are no historical commercial statistics for Bass within the Yorkshire fisheries. Increasing capture of this fish became noticeable in the early 1990s from the gill and trammel-netting fishery, which eventually led to the specific targeting of the fish by trawling, particularly off Filey Bay and Flamborough Head, where assemblages of the fish, including running ripe mature fish, now occur during the winter months (pers. obs.).

Changes in status of Red Mullet *Mullus surmuletus.*

Formerly a fish of southern waters, the Channel and, in limited numbers, the south-eastern North Sea, this fish occurred in very small numbers elsewhere throughout the North Sea and Scottish waters, being generally regarded as rare in these areas (Wheeler, 1969). Incidence for Yorkshire waters has always been low in the past, in some years occurrences not even reaching double figures. However, very small juvenile fish of some 7-10cm total length, not previously known to be present on the Yorkshire coast, were discovered from infrequent findings during the survey in Cod *Gadus morhua* stomachs but, because of their small size, were not being found in trawl samples.

Shoaling of this fish within the central North Sea showed a marked increase through the 1990s, with a brief yearly fishery developing on a centre of increasing aggregation discovered to the south-east of the Dogger Bank. Despite the subsequent targeting of this shoaling area for a brief period in summer by numerous boats of various north-east ports, including Whitby and Scarborough, together with French boats, Red Mullet appears to be increasingly successful in the North Sea. Fishing activity on this area was heavy in 2001 and included two Whitby boats landing some 1750 kilos of the fish one morning in late June, giving an indication of the strength of Mullet shoals within the central North Sea at that time.

During the last two decades, records of the occurrence of this fish on the Yorkshire coast increased steadily to the point where it is was frequently the case that as many Red Mullet appeared on just one day's market at Scarborough as were previously accumulated in 2, 3 or more years of records in the early days of the survey. More recently, young Red Mullet

;-18cm total length have been a common feature of Cod stomach contents in winter tches from near Flamborough Head.

ack-bellied Angler *Lophius budegassa*

ıe appearance of this fish in the central North Sea and Yorkshire waters over the last venty years has been documented in a previous paper (Whittaker, 2012). Poor returns om fishing activity off the Yorkshire coast since that paper was written have forced fishing tivity to take place chiefly to the north of Whitby, where this fish is now very frequent in e catches off the Hartlepool sector with, on occasion, some 20% of the *Lophius* catch ing of this species.

ıgular Crab *Goneplax rhomboides*

ıe distribution of this crab (see Plate I, centre pages) was previously confined to the lantic coasts of the British Isles, its range extending up to the Scottish west coast, but it as regarded as absent from the North Sea basin (Ingle, 1980), although a single currence had been recorded from 11 miles east of Blyth by J.A. Allen in October 1963 loore, 2000). The crab is an inhabitant of soft, sometimes sandy, mud, and on the west ast even occurs on the shore in suitable localities. Such deposits are scattered throughout e North Sea, and are frequently occupied by colonies of Norway Prawn *Nephrops ɪrvegicus*, one of the most extensive being off the coast of Northumberland and extending uth to the Whitby Fine Ground. Angular Crab was recorded as 'rare' during a diver survey ı the sandy ground off Newbiggin in July 1992 (Woolmington, 1994); single specimens ere found at the North West Rough area of the Dogger Bank in 1998 and on Smith's Knoll f Yarmouth in 2000 (d'Udekem d'Acoz, 2001) and soon afterwards specimens were also corded off the Dutch coast (Ruijer, 2004; Oosterbaan, 2005). Despite the intense trawling the Norway Prawn ground off the north-east coast every day for decades, the increasing currence of the crab in the trawl discard material was overlooked until 2006, when a ecimen taken on the Whitby Fine Ground was returned from a Scarborough whitefish awler. An immediate examination of by-catch material from Norway Prawn trawlers orking off the Hartlepool area then confirmed the abundant numbers of this crab curring in the by-catch, with *Calocaris macandreae* (Bell) also present, although the latter as previously known to be in the area. Remains of the crab have also been found in the omachs of Cod taken much further off near Baymans Hole, some 40 miles distant from e coast. More recently, in 2008, the crab was recorded for the first time off the German ast (Neumann *et al.,* 2010), and was also discovered in Swedish waters the same year erggren, 2008).

'rinkled Swimming-crab *Liocarcinus corrugatus*

ıe previously known distribution of this crab was similar to that of Angular Crab above, its nge extending up the west coast to the Orkneys but absent to the east and from the eater North Sea basin, although Ingle (1980) included an unconfirmed and dubious ıggestion of a record from Yorkshire. This same distribution is also given by Clarke (1986). single record of this crab was made by Johnston in the 1830s (Embleton, 1834) from off

the Berwickshire coast and, curiously, echoes the historically known distribution of *Geitodoris*, shown above, in that the otherwise west coast/Atlantic distribution had managed to penetrate just as far as the south-east Scottish/Northumberland border coast. This record, as with the earlier records of *Geitodoris*, has been regarded until very recently as highly suspect. Despite the intense biological recording of the English north-east coast during the 19^{th} and 20th centuries, there are no further records of this crab from the area until April 2011, when a carapace was found on the beach at Bamborough (d'Udekem d'Acoz, 2011), thus validating the singular earlier record from that area by Johnston.

This crab has never been seen during many years of sampling Yorkshire marine biological material, including trawl samples and fish stomach analyses. The first reports that some fishermen working Bridlington Bay and the Holderness coast were finding this crab in their shellfish traps were received in 2010 and the identification was confirmed when specimens were eventually secured. The crab is at present known locally only from this southern sector of the Yorkshire coastal area but may be expected to eventually extend much further north. There is no doubt that Wrinkled Swimming-crab has only very recently appeared in the area.

The significance of hydrographic criteria in relation to the Yorkshire marine biota

The biodiversity of the Yorkshire coast is determined by the hydroclimatic vagaries of the North Sea circulation impinging along the coast. The complex hydrographic system of the North Sea basin is well-known, with variable inflows of oceanic water entering from both the north and the south but with the only general outflow from the basin occurring along a narrow corridor close to the Norwegian coast (Lumby, 1932; Turrell *et al.*, 1992).

The greater influx from the north is derived mainly from the Gulf Stream via the North Atlantic Drift, together with some input from the surfacing of the underlying Lusitanian current. This inflow turns south within the basin, flowing down the western margin, its impetus slowly dissipating along the North East and Yorkshire coasts. This south-going circulation is responsible for most of the occurrences of exotic fishes from the Atlantic and fishes from more northern latitudes, such as Sun-fish *Mola*, Opah *Lampris* guttatus, Ray's Bream *Brama brama*, Greater Forkbeard *Phycis blennoides*, Dealfish *Trachypterus arcticus*, Oarfish *Regalecus* glesne, together with oceanic squids including *Todaropsis*, *Illex* and *Architeuthis*, and other organisms such as the Buoy Barnacle *Dosima fascicularis*, reaching the Yorkshire coast. The recent Yorkshire occurrences of the Leatherback Turtle *Dermochelys coriacea* and the Pilot Fish *Naucrates ductor* are examples of such exotic animals following this current (Whittaker, 2012).

The circulation of the basin is influenced by the Coriolis force which, between Flamborough Head and the Humber, creates a cyclonic (anticlockwise) turn of the water towards the east around the southern end of the Dogger Bank in a somewhat confused stream that contains small cyclonic eddies, with a greater eddy at the south-east corner of the Dogger. This front, extending to the east of the Humber, and across the Silver Pits, delineates within

varying degrees the southernmost or northernmost distribution limits of many organisms within the North Sea. The Slipper Limpet *Crepidula fornicata* is extremely common to the south and within the Silver Pits but is extremely rare further north and off the rest of the Yorkshire coast. Similarly, while there are abundant records for the Sting Ray *Dasyatis* to the south of this front, this fish very rarely penetrates further north to the Yorkshire coast, most of the rare occurrences being restricted to small juvenile fish (pers.obs.).

Due to the Coriolis effect, warmer water entering from the Channel via the Dover Straits flows principally to the east along the continental coast towards the Heligoland Bight but a smaller flow extends to the west, flowing north along the English coast and dissipating near the Humber. This is responsible for the Yorkshire occurrences of southern fishes such as Sea Bass, Red Mullet, John Dory *Zeus faber*, the members of the Sea-breams and probably also the increasing Yorkshire occurrences of the Atlantic Bonito *Sarda sarda*. This current has also assisted the spread and establishment of Japweed as far as the Norfolk coast. The distribution of the warm-water squid *Loligo vulgaris* extends from the Channel into the southern North Sea, principally off the continental coasts where it is known to reproduce but, due to this circulation, this squid also occurs with sporadic but low frequency as far north as Scarborough (pers obs.), where it was unrecognised by Stevenson (1935).

This water mass induces the introduction of organisms of a southern distribution from the Channel into the southern North Sea, where most establishment of invasive biota takes place along the continental coasts, as typified by Japweed that has thus penetrated as far north as Sweden and southern Norway. The recent occurrence of the nudibranch *Geitodoris* on the Netherlands and German coasts has followed this pattern of invasion.

Although the western margin of the North Sea basin is thus roughly divided by circulation into two sectors at the approximate latitude of the Humber, this overall picture is highly variable since the influx of water from either entrance to the basin may vary to a greater or lesser extent from year to year. In addition to the underlying residual currents thus created, the complexity of semi-diurnal tidal cycles of ebb and flood within the basin creates temporary daily reversals of flow and therefore differing transport paths depending on the state of the tide at any given locality.

Although the residual current of the Yorkshire coast is from north to south, a tidal flow from south to north becomes evident for a period during the ebb cycle before and after high water at Dover, during which period drifting and pelagic organisms can be transported contrary to the normal residual current. In the southern North Sea these tidal cycles also create flows contrary to the residual current there (Anon, 1942), allowing the transport of larvae or drifting organisms from the continental to the English coasts. Additional meteorological conditions of extreme southerly or easterly gales may enhance these tidal streams and such transport pathways, hence the recent occurrence of drifted Japweed as far north as Robin Hood's Bay. The occurrence of this alga also demonstrates a possible

mechanism for the progressive direct transport of small organisms to the Yorkshire coast from waters to the south and east, such as *Zenobiana*, by clinging to drifting flotsam.

Discussion

The changes in biodiversity noted for the Yorkshire coast denote immense biological changes taking place here as elsewhere within the North Sea, with many species either newly colonising or expanding their range within this semi-enclosed sea basin, as a result of climatic change and increasing sea temperatures, those of British coastal waters having risen by up to 1°C since the mid-1980s (Hawkins *et al.,* 2003) and those of the southern North Sea being particularly noticeable. Increasing and pronounced climate-induced response of the marine ecosystem has been recorded, including the more pronounced warming of the north–east Atlantic over that of the global average (Intergovernmental Panel on Climate Change, 2007).

The Yorkshire coast is somewhat unique in the overlapping hydrographic influences it receives, since it is at the tail end of currents derived from the Gulf Stream via the North Atlantic Drift but also receives influence derived from the Channel influx and may, therefore, receive invasive biota from either north or south. The question as to how taxa newly arrive or expand within the Yorkshire area is not easily answered and may be different for some of the various taxa under consideration. The warming of the North Sea is considered to be responsible for the increased numbers of the commercially valuable Sea Bass and Red Mullet off the Yorkshire coast since 1990, but crustaceans in particular appear to have benefited from the increase in water temperatures (Lindley *et al,* 2010; Lindley & Kirby, 2010). The earliest Yorkshire indicator of these changes was the Velvet Swimming-crab whose population is considered to have begun to expand locally towards the end of the 1970s and which by 1990 had become prolific.

The presence of *Zenobiana* in the area is more problematical. It had either been completely overlooked in the North Sea prior to 1976 or has extended its range into the North Sea in recent decades. Without special collecting techniques, species inhabiting cases of hollow algal fragments or nests among algae could perhaps easily be overlooked. However, since individuals can on rare occasions be discovered without any form of concealment, and given that this species is very distinct and instantly distinguishable from all other marine isopods, it is unlikely to have been so overlooked for any length of time on the Yorkshire coast, prior to the survey by Bird & Morris (1992). *Zenobiana* must, therefore, be regarded as having extended its distribution to the central North Sea in recent decades.

The north-east population expansion of Angular Crab appears to have taken place from the 1990s and, from the vast numbers already present in the north-east Norway Prawn by-catch in 2006, must have been equally as rapid as that of Velvet Swimming-crab. Neumann *et al.* (2010) suggest that the expansion of Angular Crab in the southern North Sea may have been due to the enhanced survival of larvae that had entered from the Channel, due to the increase in sea temperature, particularly as winter sea temperatures there are also

higher than formerly. However, this explanation does not take into account the considerable eruption of the population off the Northumberland coast much earlier in the decade, the first German and Swedish specimens not being recorded until 2008 from areas that had been sampled frequently over many years previously, and it would therefore be more reasonable to consider that the increase in population was triggered in the north-eastern North Sea, with the population increasing rapidly through the rest of the North Sea through successive years of increasing numbers of larvae being transported down the North Sea.

The increase in abundance of the Common Prawn has similarly taken place within the last decade, while the extension of the range of the Wrinkled Swimming-crab is even more recent and has taken place within the last five years. Both of these events occurred at the southernmost extent of the Yorkshire coast and both these crustaceans of southern, warm-water distribution are considered to have expanded their range to the Yorkshire coast from the southern North Sea.

The nudibranch *Geitodoris* has no previous historical record within the North Sea basin other than the proven tentative, rare presence from offshore in the Berwickshire area, but there is no evidence of even minor spread from this locality to the immediately adjacent coastline. Although this nudibranch has long been recognised to have a greater occurrence in the warmer conditions of the Channel coasts, it has only increased its range to the southern North Sea within the last decade and it is therefore considered that its occurrence on the Yorkshire coast is, like those of Common Prawn and Wrinkled Swimming-crab, a signal of climate change and the result of northward expansion from the warmer southern North Sea, rather than from the apparently static and small Berwickshire population.

It is pertinent to note that three of the changes described here have given additional opportunity to the Yorkshire fisheries, with targeted and previously unknown commercial exploitation of Velvet Swimming-crab, Red Mullet and Sea Bass developing here from 1990. Despite these new opportunities, the historically important gadoid fisheries have collapsed and moved northwards away from the Yorkshire coast.

References

Anon (1942) *Pocket Tidal Stream Atlas; North Sea, Southern Portion*. Hydrographic Department of the Admiralty.

Alder, J. & Hancock, A, (1845-1855) *A monograph of the British nudibranchiate Mollusca*. 369 pp. London: Ray Society.

Alder, J. & Hancock, A. (1862) Description of a new genus and some new species of naked Mollusca. *Ann. Mag. nat. Hist.* 10: 261-265

Anderson, J. (2013). *Scottish Nudibranchs.* at www.nudibranch.org/ScottishNudibranchs/geitodoris-planata.html

Berggren, M. *New crab found in Swedish waters.* University of Gothenberg News Archive http://www.science.gu.se/english/News/News_detail//new-crab-found-in -Swedishwaters.cid808365

Bird, G.J. & Morris, E. (1992) *Summary report on the rocky-shore survey carried out on Yorkshire NRA Region's coastline during 1991*. Unpublished, National Rivers Authority, Yorkshire Region, Biology North. (Biology Report, No. BN 9/92.)

Clarke, P.F. (1986) *North-East Atlantic crabs: an atlas of distribution*. Marine Conservation Society, Ross on Wye, 252pp

Cole, H.A. (1958) *Notes on the Biology of the Common Prawn,* Palaemon serratus *(Pennant) Fish.* Invest. Series II, Vol. XXII, No.5

Critchley, A. T., Farnham, W. F. & Morrell, S. L. (1983) A chronology of the new European sites of attachment for the invasive brown alga, *Sargassum muticum*, 1973-1981. *J. mar. biol. Ass. UK,* 63: 799-811

Dawson, R., (1870) *A catalogue of the Mollusca of the counties of Aberdeen, Banff and Moray and the neighbouring seas*. Aberdeen.

d'Udekem d'Acoz, C. (2001) New records of *Monodaeus couchi* (Couch,1851) and *Goneplax rhomboides* (Linnaeus, 1758) in the North Sea (Crustacea, Decapoda, Brachyura). *Strandvlo* 21: 48-55.

d'Udekem d'Acoz, C. (2011). A further record of *Liocarcinus corrugatus* (Pennant, 1777) in Northumberland, England, northwestern North Sea (Crustacea, Decapoda, Brachyura) *Strandvlo* 31 (2) 48-50

Elliot, C. N. E. (1910). *A monograph of the British nudibranchiate Mollusca: with figures of the species*. Part VIII (Supplementary). 198 pp London: Ray Society.

Embleton, R.(1834) List of Malacostrata Podophthalmata, found on the coasts of Berwickshire and North Durham, years 1832-1841. *History of the Berwickshire Naturalist's Club* 1 (3): 69-72 + pl. 1.

Farnam, W., Fletcher, R. L.. & Irvine, L.M. (1973) Attached *Sargassum* found in Britain. *Nature*, 243: 231-232.

Hawkins, S.J., Southward, A.J. & Genner, M.J. (2003) Detection of environmental change in a marine ecosystem - evidence from the western English Channel. *STOTEN* 310: 245-256.

Hayward, P. J. & Ryland, J. S. (1990) *The Marine Fauna of the British Isles and North-West Europe*. Oxford.

Ingle, R.W. (1980) *British Crabs* British Museum (Natural History), Oxford University Press.

IPCC (2007) *Climate Change 2007: The Physical Scientific Basis*. Cambridge University Press, Cambridge.

Jeffreys, J. G. (1867) *British conchology, or an account of the mollusca which now inhabit the British Isles and surrounding seas.* Vol 4 486 pp. London.

Lindley, J.A., Beaugrand, G., Luczak, C., Dewarumez, J.-M. & Kirby, R.R. (2010) Warm water decapods and the trophic amplification of climate in the North Sea. *Biology Letters vol.6 no. 6* 773-776.

Lindley, J.A., & Kirby, R.R. (2010). Climate-induced changes in the North Sea Decapoda over the last 60 years. *Inter Research CR vol.42 no.3* p257-264.

Lumby, J. (1932) Current systems of the North Atlantic and the North Sea. *J.Ecol*, 20, 314-325

Marine Biological Association, (1957). *Plymouth Marine Fauna*, 3rd ed., 453 pp., Plymouth.

McKay, D. W. & Smith, S. M., (1979) *Marine Mollusca of East Scotland*. Royal Scottish Museum.

Moore, J. (2000) Crustacea: Decapoda in Foster-Smith, J., ed. *The Marine Fauna and Flora of the Cullercoats District*. Vol. 1 Newcastle University, Penshaw Press.

Naylor, E. (1972) *British Marine Isopods, Synopses of the British Fauna*, New Series, 3, Academic Press, London and New York.

Neumann, H. Ehrich, S. and Kronke, I. (2010) Establishment of the angular crab *Goneplax rhomboides* (Linnaeus, 1758) (Crustacea,Decapoda, Brachyura) in the southern North Sea *Aquatic Invasions Vol. 5* Supplement 1: S27-S30.

Oosterbaan, A.(2005) Hoekige krab rukt op [The angular crab is advancing]. *Natura* (Utrecht) 102: 75.

Picton, B. E., & Morrow, C.C., (1994). *A Field Guide to the Nudibranchs of the British Isles*. Immel Publishing.

Rueness, J. (1989) *Sargassum muticum* and other introduced Japanese macroalgae: biological pollution of European coasts. *Marine Pollution Bulletin*, 20: 173-176.

Ruiitjer, R.(2004) CS-verslag. *Het Zeepaard* 64: 165-171.

Schubert, P. (2002) http://www.seaslugforum.net/find/9588.

Sheader, M. (2000) Isopoda in Foster-Smith, J., ed. *The Marine Fauna and Flora of the Cullercoats District*. Vol. 1 Newcastle University, Penshaw Press.

Stevenson, J.A. (1935) The Cephalopoda of the Yorkshire Coast. *J. Conch.*, 20, 102-116.

Thompson,T. E. & Brown, G. H. (1976) *British Opisthobranch molluscs*. London, Linnaean Society & Academic Press. Pp 1-203.

Thompson, T. E. & Brown, G. H. (1984) *British Opisthobranch molluscs*. Ray Society.

Turrell, W.R., Henderson, E.W., Slesser, G., Payne, R. and Adams, R.D. (1992) Seasonal changes in the circulation of the northern North Sea. *Continental Shelf Research* 12 2-3, 257-286.

Van Bragt, P. (2001). http://www.seaslugforum.net/find/5125.

Walton, C.L., (1908) Nudibranchia collected in the North Sea by the SS 'Huxley' during July and August 1907. *J. mar. biol. Ass. UK* 8: 227-240.

Wheeler, A. C. (1969). *The Fishes of the British Isles and North-west Europe*. 613 pp. London: Macmillan.

Whittaker,D.E (2011). On the first Occurrence of the Pilot-fish in the central North Sea in association with a Leatherback Turtle. *The Naturalist*, 136, 185-186.

Whittaker. D.E. (2012) On the recent appearance of the Black-bellied Angler, *Lophius budegassa*, in the central North Sea. *The Naturalist*, 137, 16-21

Woolmington, A.D. (1994) *Newbiggin by the Sea marine treatment scheme*. Baseline/ precommissioning report for Northumbrian Water Ltd. Entec AE report No 27005/1

Seasonal trends in emergence times and culling pressure on the Red Fox in lowland South Yorkshire

C.A. Howes
email: colinhowes@blueyonder.co.uk

Introduction

The Red Fox *Vulpes vulpes* is mainly nocturnal and crepuscular with an element of diurnal activity, though this is dependent on the degree of local persecution. For instance, where foxes are tolerated, daylight sightings are quite frequent in city centres . In summer they may remain active long after dawn, especially the vixens when feeding young cubs (Baker & Harris, 2008).

Post-emergence behaviour as monitored by radio tracking is highly variable. A rural study in southern England showed that activity peaked in the hours after sunset and before sunrise (Reynolds & Tapper, 1995). In one study of urban foxes they were found to be most active after midnight (Woolland & Harris, 1990) and a study in urban Oxford showed that activity levels declined after midnight (Doncaster & Macdonald, 1997). The Oxford foxes were active for a mean of 6 hours 52 minutes irrespective of time of year, this being made up of cycles of active and resting periods characteristically of 2 to 2½ hours long. Similar studies in Bristol revealed a mean nocturnal activity periods of 8 hours 12 minutes (Saunders *et al.*, 1993).

Though seasonal trends in the timing of the nocturnal emergence of the Badger *Meles meles* are well documented (see Neal, 1977 and 1986), as yet there are few equivalent published analyses of the emergence behaviour in the Fox, despite the popularity of watching urban Foxes and with the recent availability of electronic devices to remotely monitor mammal activity.

Sources and methods

In 1970 Mr Jim McGarry, working as a gamekeeper/pest control contractor, deposited at Doncaster Museum and Art Gallery a set of five 'Lion Brand' writing pads filled with his notes, records and observations of Foxes within the lowland agricultural parishes of Thorpe in Balne (SE5910), Kirk Bramwith (SE6111), Fishlake (SE6513), Sykehouse (SE6216) and Moss (SE5914) situated between the tidal rivers Don and Went within the Metropolitan Borough of Doncaster.

Among these notes were observations made in 1969 at a series of natal Fox earths. Sixty nocturnal visits were made to one site simply referred to as 'Fox Holes'. On thirty-nine of these visits the times at which Foxes first emerged were recorded. The nature and outcomes of eighteen culling incidents throughout the study area were also recorded. These data form the basis of the current study.

Since British Summer Time (BST) was experimentally extended from 18 February 1968 to 31 October 1971, the entirety of 1969 remained as BST; consequently it was not necessary to convert timings between GMT and BST in spring and autumn. These times have been plotted against days after 1 January and compared with local daily sunset times for 1969 obtained from nearby Finningley (Robin Hood) Airport located at 53°28'1"N 1°0'0".

Results and discussion

Figure 1 shows that emergence times varied from as early as 1,081 minutes (18.01hrs) on day 46 (15 February) to as late as 1,220 minutes (20.20hrs) on day 167 (16 June) and broadly oscillated around sunset time, ranging from 43 minutes before to 33 minutes after sunset with a mean of 15.2 minutes before sunset. Unlike equivalent graphs for the emergence times of Badgers (*loc. cit.*) and Daubenton's Bats *Myotis daubentoni* (Oxford *et al.,* 1996) which show an even seasonal association with sunset time, figure 1 indicates Fox

emergence up to day 125 (5 May) to be exclusively after sunset and thence exclusively before sunset.

By representing sunset time as zero and showing emergence times as minutes before or after sunset, figure 2 allows a clearer analysis of the relationship between sunset and the seasonal patterns of emergence behaviour. In the early part of the breeding cycle when the cubs were at an early stage of development, remaining constantly below ground, the series of emergence times ranged from 105 minutes to 10 minutes (mean 48.5 minutes) after sunset.

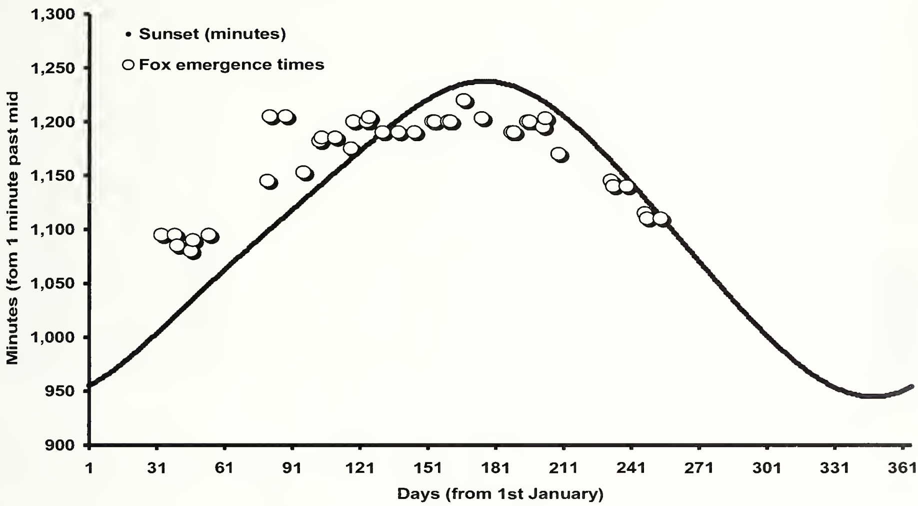


Figure 1: 39 emergence times of Foxes plotted against local sunset time (BST).

The general trend during this period, however, was for emergence to become progressively earlier with emergence precisely at sunset on 11 May (day 131). Above-ground activity is known to be reduced on cold wet nights (Baker & Harris, 2008); indeed this study shows that particularly late emergence times coincided with periods of windy, cold and stormy weather (see figure 2).

From late April, when cubs begin to appear above ground (Harris & Baker, 2001), emergence times became progressively earlier, the earliest time 43 minutes ahead of sunset being recorded on 6 and 7 July. During July and August, when cubs increasingly lie up away from the natal earth (Harris & Baker, 2001), the trend in observed evening activity times became progressively later, the last time recorded on 9 September being just 2 minutes before sunset. Recorded emergence times were cut short on 10 September and we see from Mr McGarry's notes that the natal earth was gassed on 11 September (day 254). Despite 21 evening visits from 17 September no sign of re-occupancy was noted until 25 December.

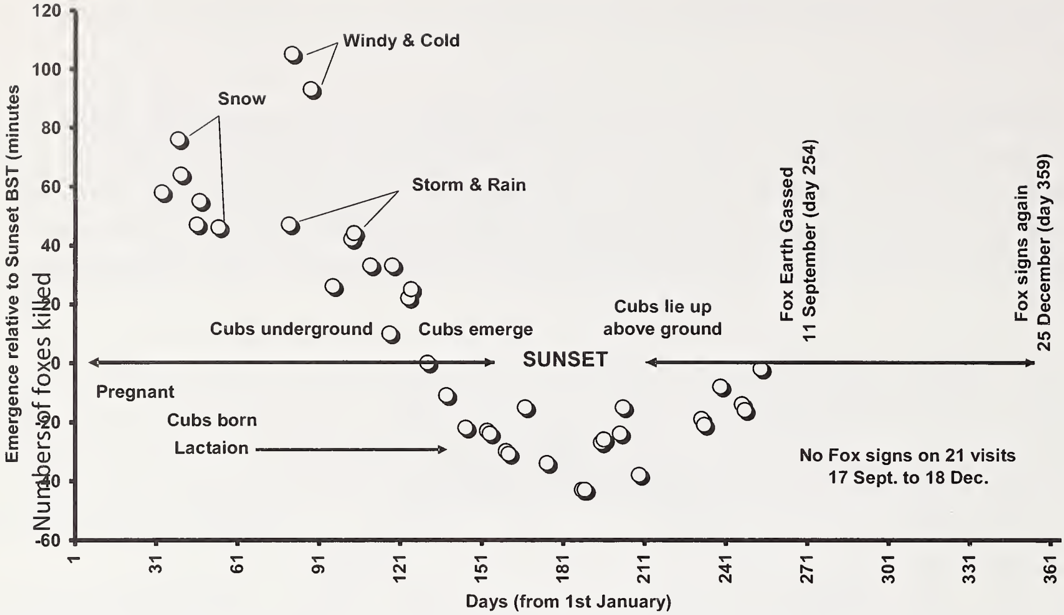


Figure 2: Emergence times of Foxes related to weather conditions and cub development. Seasonality of cub activity based on Harris & Baker (2001).

Mortality

During the year there were nine cases of occupied earths being dug out and four cases of earths being gassed. Culling methods were shooting 24 (34%), terriers 9 (13%), gassing 5 (7%), hunting 2 (3%), not stated 30 (43%). Since the bodies of gassed animals remain underground unless dug out, it is likely that body counts of gassed foxes are under-recorded. Of the 70 foxes culled from the local population in 1969, cubs numbered 49 (70%), adult vixens 12 (17%) and adult dog foxes 9 (13%), the seasonality of recorded culling is shown in figure 3. Within the 55 x 1km^2 study area the culling pressure equated to 1.27 per km^2.

Since annual cub survival and population levels can fluctuate widely according to land use, game management, weather and levels of disease, it is difficult to judge how significant this culling level may have been. The Game Conservancy Trust based population estimates of adult Foxes at the start of the breeding season in 1995 to 1997 on night counts conducted using spotlights along roads in East Anglia, the Midlands and mid-Wales (Heydon *et al.*, 2000). In these areas it was estimated that Fox densities varied from 0.16 to 1.17 Foxes/km^2 though it is now widely believed that this method underestimates population figures (Baker *et al.*, 2006).

The Mammal Society national Fox survey of 1999/2000, based on counts of Fox droppings in 444 sampled 1km squares in different landscapes across Britain, revealed Fox densities ranging from 0.21 to 2.23 per km^2 (Webbon *et al.*, 2004). On the basis of these surveys it would seem that the culling pressure in the interests of game preservation in our Doncaster

study area was particularly high, though it was ironic, considering the political antipathy to fox hunting, that the local fox hunt only accounted for 3% of the overall cull.

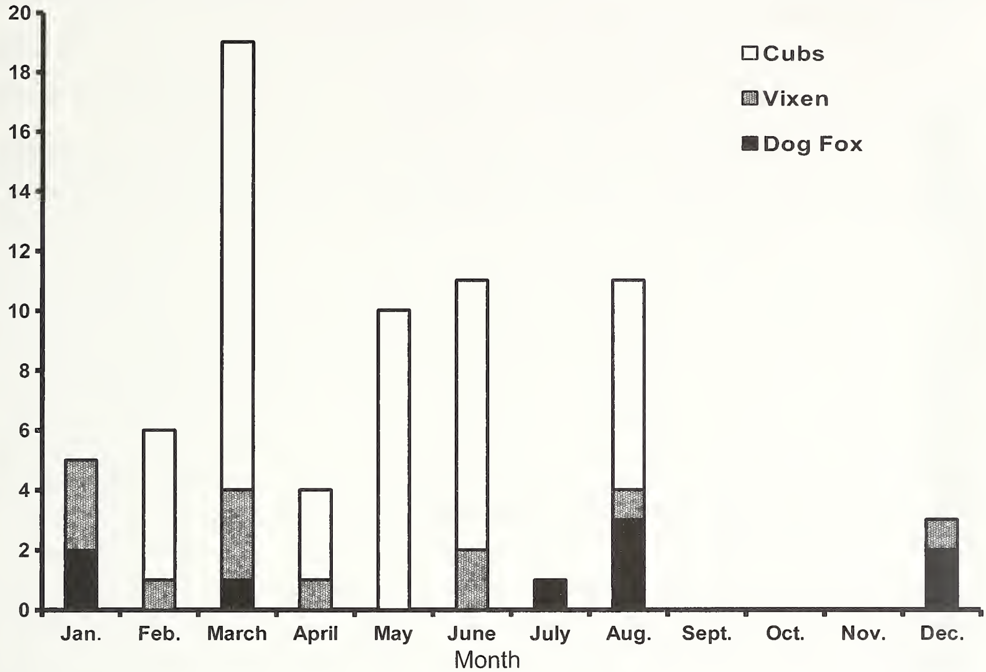


Figure 3: Seasonality of 70 Foxes killed in the study area during 1969.

Acknowledgements

Thanks are due to Jim McGarry for his field notes which formed the basis of this study and to Doncaster Museum and Art Gallery for access to these archives.

References

Baker, P., Harris, S. and White, P.C.L. (2006) *After the hunt – the future for foxes in Britain*. International Fund for Animal Welfare, London.

Baker, P. and Harris, S. (2008) Fox *Vulpes vulpes* (pages 407-423) in Harris,S. and Yalden, D.W. (eds.) *Mammals of the British Isles: Handbook*, 4th Edition. The Mammal Society, Southampton.

Doncaster, C.P. and Macdonald, D.W. (1997) Activity patterns and interactions of red foxes *Vulpes vulpes* in Oxford city. *Journal of Zoology* **241**: 73-87.

Harris, S. and Baker, P. (2001) *Urban Foxes*. 2nd edition. Whittet Books, Stowmarket.

Heydon, M.J., Reynolds, J.C. and Short, M.J. (2000) Variation in abundance of foxes *(Vulpes vulpes)* between three regions of rural Britain, in relation to landscape and other variables. *Journal of Zoology*, **251**, 253-264.

Neal, E. (1977) *Badgers*. Blandford Press, Pool.

Neal, E. (1986) *The Natural History of Badgers*. Croom Helm, London.

Oxford, G., Drewett, J., Lane, T., Moodie, J., Moodie, P. and Oxford, R.H.(1996) Studies of Daubenton's Bat *Myotis Daubentoni* at Kexby Bridge, North Yorkshire: Seasonal and annual fluctuations in numbers and factors affecting emergence times. *The Naturalist*, **121**: 87-96.

Reynolds, J.C. & Tapper, S.C. (1995) The ecology of the red fox *Vulpes vulpes* in relation to small game in rural southern England. *Wildlife Biology* **1**: 105-119.

Saunders, G., White, P.C.L., Rayner, J.M.V. and Harris, S. (1993) Urban foxes (*Vulpes vulpes*); food acquisition, time and energy budgeting of a generalised predator. *Symposium of the Zoological Society of London* **65**: 215-234.

Webbon, C.C., Baker, P.J. & Harris, S. (2004) Faecal density counts for monitoring changes in red fox *(Vulpes vulpes)* numbers in rural Britain. *Journal of Applied Ecology,* **41**, 768-779.

Woolland, T. and Harris, S. (1990) A behavioural comparison of dispersing and non-dispersing foxes (*Vulpes vulpes*) and an evaluation of some dispersal hypotheses. *Journal of Animal Ecology* **59**: 709-722.

Field Note: Herring Gull feeding on Swallow

On a visit to Doncaster Lakeside Park (SE594016) at 5pm on 5 May 2012, under an overcast sky and with a brisk and chilly easterly wind creating choppy water conditions, the main body of the lake was being actively worked for insects by hundreds of migrating Swallows *Hirundo rustica*, House Martins *Delichon urbicum* and Sand Martins *Riparia riparia* with a small number of Swifts *Apus apus*. The birds were hawking very low in a zone no more that 3m above the water surface. In mid-water, out amongst this busy turmoil of hawking hirundines, were small numbers of feeding Great Crested Grebes *Podiceps cristatus*, Tufted Duck *Aythya fuligula*, Coot *Fulica atra* and apparently roosting Black Headed Gulls *Chroicocephalus ridibundus*, Common Gulls *Larus canus* and Herring Gulls *Larus argentatus*. Two of the adult Herring Gulls were creating a conspicuous and static symmetrical pattern, appearing to be attached at the beak and holding or stuck to a black object. After a few moments one of the gulls broke free and the dark object could be identified as the body and narrow swept-back wings of a Swallow. Whether the Swallow had ditched in the choppy water and been scavenged or been plucked from the air by one of the gulls was not seen, but the incident represented an interesting seasonally opportunistic feeding behaviour of these large gulls.

Placing this anecdote in context, John Wint of the YNU Ornithological Section comments “It is common to see the larger gulls feeding on - or even attacking for 'fun' - incoming migrants just offshore on the east coast in the autumn”. Subsequent visits to Lakeside have found the remains of two Swallows and one Swift amongst the shoreline flotsam, indicating that these aerial-plankton feeders do occasionally ditch while hunting over choppy waters.

Colin A. Howes

Tree colonization following sheep exclusion alongside the A169 across the North York Moors

R. Goulder 5 Bishops Croft, Beverley HU17 8JY
email: r.goulder@hull.ac.uk

Introduction

Wide expanses of upland heath, dominated by Heather *Calluna vulgaris* and essentially devoid of trees, are characteristic of the North York Moors National Park (Atherden & Simmons, 1996). The land is maintained and managed by periodic burning and is used for grouse shooting and sheep grazing. Soils are generally shallow, overlie Jurassic sandstones and shale and are leached, acid and nutrient-poor. They have an underlying iron-oxide pan which is impermeable to plant roots, hinders drainage and locks up nutrients beneath it. The lack of trees is a result of human activity: today's moorlands were once forest. This is evidenced by the remains of forest-derived soils found beneath Bronze Age barrows (Dimbleby, 1962) and by extensive studies of pollen preserved in peat deposits (Atherden, 1992). For example, the pollen record for Fen Bog (Atherden, 1976a, 1976b, 1999), a site that is within 0.5km of the road addressed in this article, suggests that in the early post-glacial period, from about 10,000 years ago, birch and then pine were important in the area. From c.7,000 years ago to c.2,300 years ago, a period that encompassed the probable hunter-gatherer and shifting agriculture of Mesolithic, Neolithic and Bronze Age cultures, oak and alder were important, albeit with an increasing proportion of grass and herb pollen latterly. Following this, and corresponding with Iron Age and Romano-British culture, and increased demand for timber and more settled agriculture, tree pollen became less dominant while that of grasses and herbs increased and cereals appeared. During the Dark Ages (c.1,600 to 1,100 years ago) and again in the Post-Medieval Period (c.430 to 180 years ago) the pollen record suggests transient increases in tree and shrub cover, notably birch and Hazel *Corylus avellana,* although Heather pollen was also important, indicating that open ground remained. These resurgences were presumably related to depression in agricultural/socio-economic conditions. The final preponderance of Heather pollen was established about 180 years ago, indicating a mid-19th century shift to the present-day regime of Heather moorland.

A number of major roads cross the moors and many of them are now fenced to prevent collisions between vehicles and sheep. Atherden (1992) points out that this leaves a strip of ungrazed moorland between the carriageway and the fence which might eventually be colonized by trees and shrubs; a succession that might be interesting to study. The A169 Whitby-Pickering road from the top of Blue Bank (NZ867058), 11.5 km southwards to Saltergate Bridge (SE853948), is an example of a fenced main road that crosses open moorland. A plaque in the car park adjacent to the top of Blue Bank was "unveiled October 1988 following completion of the Pickering to Whitby Moorland Road Fencing Project ···· to prevent the killing of sheep on the highway". There has been regeneration of trees and shrubs alongside this road over the 25 years since sheep were excluded. This is obvious to

travellers along the A169 and the fact that the process has entered the popular consciousness is suggested by the tinsel and bauble decoration of occasional conifers as if they were Christmas trees. The relevance of the fence to regeneration is shown, for example, by comparison with the minor road to Goathland which diverges from the A169 at NZ855034; this road, which remains unfenced, traverses the Heather-dominated Goathland Moor and has margins that are devoid of trees and shrubs.

The work described in this contribution: (1) counted and identified trees and shrubs along the west side of the A169 between the top of Blue Bank and Saltergate Bridge; (2) recorded trees and shrubs beyond the roadside but in the environs of the A169 that are potential sources of seed; (3) compared the rate of regeneration of trees and shrubs along the upland roadside with that at Dalby Forest, a more favourable habitat in the North York Moors area; (4) explored reasons for a relatively slow rate of tree colonization along the A169 roadside.

Trees, shrubs and ground vegetation along the A169

Almost all of the 11.5km of road between the top of Blue Bank and Saltergate Bridge is above 200m altitude (Fig. 1). The highest point (288m) is at 2.65km while low points are at the crossing of Brocka Beck (200m) at 5.2km and Eller Beck (170m) at 7.9 km (distances are by road from the top of Blue Bank). Along the west side of the road the fence is generally sited 20-25m from the edge of the carriageway, is usually about 1.1m in height and consists of strands of galvanized wire stapled to round wooden posts about 1.9m apart. Mostly there is a roughly-mown grassy verge alongside the tarmac, about 3m wide, then a ditch and then Heather-dominated moorland, or in some places rough grassland, up to the fence. The Heather on the roadside is not subject to burning nor is that immediately adjacent to the fence on the far side, presumably to spare the fence posts from fire. An additional feature is that between 2km and 3km the fence diverges to about 125m from the road. Also, at about 7.9km, where the Yorkshire Wildlife Trust's Fen Bog Reserve (established 1964; Round, 2012) abuts the A169, the fencing turns westwards at about 100m north and about 300m south of Eller Beck to enclose the Eller Beck Valley west of the road. This valley, protected from burning and grazing, has a long-established community of trees and shrubs.

For recording purposes, the road was divided into twenty-three 0.5km sections and the trees and shrubs in each section along the west side of the road between the carriageway and the fence were identified and counted. Recording, from June to November 2011, was done on foot and separate note was made of individuals more than 2m in height. In addition the parallel strip of 20-25m wide heathland beyond the fence was scanned for trees and shrubs. Those along the roadside at Eller Beck, where both the roadside and the valley beyond are protected from grazing, were not included because they represent a long-established community rather than recent regeneration. Hence in the section from 7.5-8.0km south of Blue Bank only the northern 300m were recorded, while in the section 8.0-8.5km only the southern 300m were recorded. Ground flora at about the mid-point of each 0.5km section was recorded on both sides of the fence. A 2m x 2m quadrat was placed

in representative vegetation and vascular plants and bryophytes were identified and scored according to their approximate ground cover using the Braun-Blanquet abundance scale (Kent, 2012).

Twenty-four species of trees and shrubs were found between the carriageway and the fence (Table 1 and Plate II, centre pages). This is omitting several low-growing woody heathland species that were also present; i.e. Heather, Crowberry *Empetrum nigrum*, Bell Heather *Erica cinerea*, Cross-leaved Heath *Erica tetralix*, Bramble *Rubus fruticosus* agg. and Bilberry *Vaccinium myrtillus*.

Table 1. Trees and shrubs recorded on the west side of the A169 between the carriageway and fence over 11.5km southwards from the top of Blue Bank to Saltergate Bridge; June-November 2011.

Species of tree/shrub	*n* of 0.5km lengths of road in which species recorded (out of 23)	*n* of individuals >2m height	Total *n* of individuals
Acer pseudoplatanus (Sycamore)	1	0	1
Betula pendula (Silver Birch)	10	9	27
Betula pubescens (Downy Birch)	18	15	64
Cotoneaster horizontalis (Wall Cotoneaster)*	1	0	1
Crataegus monogyna (Hawthorn)	21	22	94
Cytisus scoparius (Broom)	1	0	6
Fraxinus excelsior (Ash)	9	4	20
Ilex aquifolium (Holly)	4	2	6
Juniperus communis (Common Juniper)*	2	0	8[†]
Picea abies (Norway Spruce)	2	1	2
Picea sitchensis (Sitka Spruce)	5	3	6
Pinus contorta (Lodgepole Pine)	7	12	23
Pinus pinaster (Maritime Pine)*	1	1	1
Pinus sylvestris (Scots Pine)	6	7	22
Prunus spinosa (Blackthorn)	7	0	10
Quercus cerris (Turkey Oak)*	3	2	3
Quercus petraea (Sessile Oak)	2	1	2
Quercus robur (Pedunculate Oak)	1	0	1
Rosa canina (Dog-rose)	16	2	84
Salix alba (White Willow)	2	0	2
Salix caprea (Goat Willow)	11	6	41
Salix cinerea (Grey Willow)	18	45	205
Sorbus aucuparia (Rowan)	23	40	175
Ulex europaeus (Gorse)	10	0	>250
Total of all species (except Gorse)	-	172	804

*Not otherwise recorded within 1.0km of the road. [†]Includes four Juniper surviving from a batch planted in rabbit guards.

Gorse *Ulex europaeus* was especially abundant immediately south of the top of Blue Bank with >200 individuals recorded between 0-0.5km. Otherwise the most abundant species were Grey Willow *Salix cinerea* with 205 individuals, Rowan *Sorbus aucuparia* 175 individuals, Hawthorn *Crataegus monogyna* 94 individuals, Dog-rose *Rosa canina* 84 individuals and Downy Birch *Betula pubescens* 64 individuals. Coniferous trees were most notably represented by Lodgepole Pine *Pinus contorta* 23 individuals and Scots Pine *Pinus sylvestris* 22 individuals. Most trees and shrubs were small. Only 172 (21%) out of a total of 804 individuals (which excludes Gorse) were >2m in height; these included 45 Grey Willow, 40 Rowan, 22 Hawthorn, 15 Downy Birch and 12 Lodgepole Pine. The more widely distributed species, in that they occurred in more of the 0.5km sections, were Rowan which was recorded in all 23 sections, Hawthorn in 21 sections, Downy Birch and Grey Willow both in 18 sections, Dog-rose in 16 sections, Goat Willow *Salix caprea* in 11 sections and Silver Birch *Betula pendula* and Gorse both in 10 sections. There were many more trees and shrubs in the fenced-off roadside strip than on the open moorland beyond; altogether only five individuals were recorded along 11.5km of road in the 20-25m wide parallel strip west of the fence (2 Gorse, 2 Downy Birch, 1 Rowan).

The species richness of trees and shrubs per 0.5km of roadside was very variable and ranged from 2-14 species (Fig.1). Species richness was higher closer to the top of Blue Bank (8-14 species per 0.5km between 0-5.0km) than further south (2-6 species per 0.5km from 8.0-11.5km). Exceptions to this were high values of 11 and 10 species per 0.5km close to the Eller Beck Valley at 6.5-7.0km and 7.5-8.0km. Linear regression analysis indicated significant decrease in species richness with distance southwards ($P<0.01$).

The density of total trees and shrubs per 0.5km and of those >2m high decreased with distance southwards ($P<0.01$), although there was quite a lot of irregular variation superimposed on this pattern (Fig.1). Thus the total number of trees and shrubs (excluding Gorse) from 0-4km south of Blue Bank ranged from 29-109 per 0.5km compared to 8-25 per 0.5km from 8.5-11.5km. Similarly, trees >2m high ranged from 4-21 per 0.5km from 0-4km south of Blue Bank compared to 2-7 per 0.5km between 8.5-11.5km. No relationships were found between mean altitude of each 0.5km section of road and species richness, n of total trees/shrubs, nor n of trees/shrubs >2m (r=0.37-0.40, n=23, $P>0.05$). The most obvious feature of these quantitative results is that, although the regeneration of roadside trees is eye-catching, the absolute density of trees and shrubs remains low after approaching 25 years of regeneration. The total roadside area surveyed, from which sheep were excluded, was approximately 30ha. Excluding Gorse the overall density of trees and shrubs equalled about 27 individuals per hectare and about six per hectare for individuals >2 m in height.

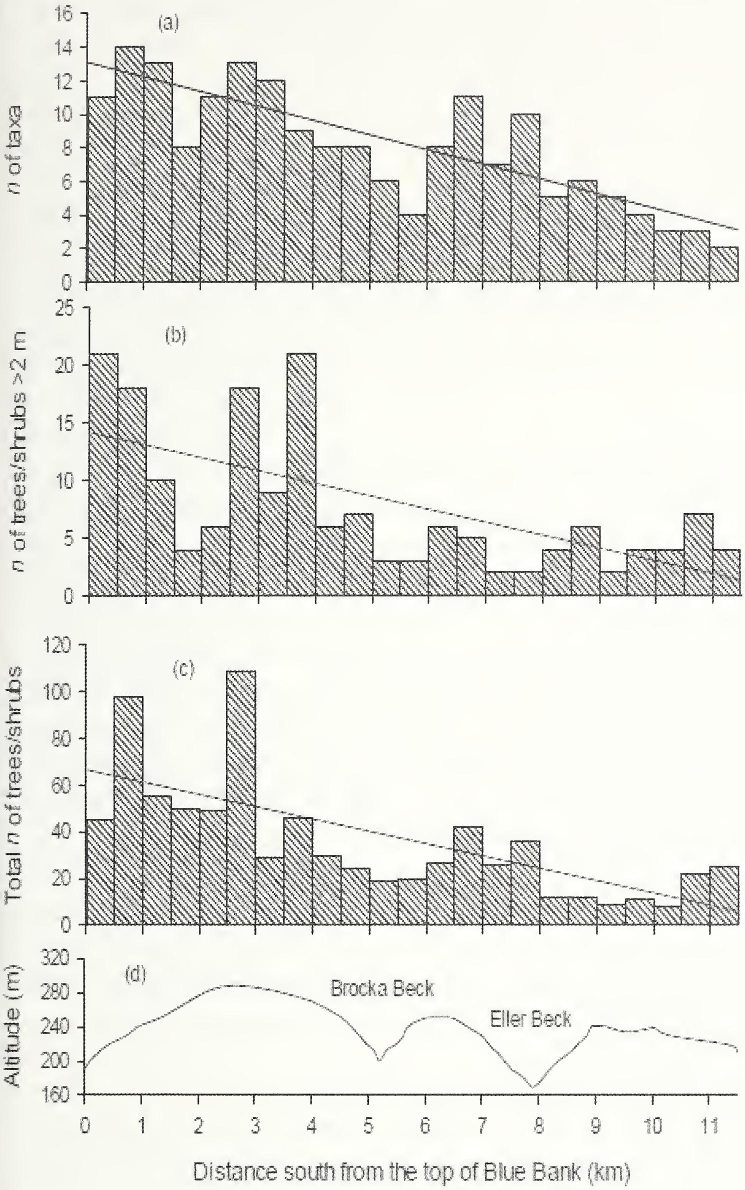


Figure 1. Trees and shrubs along the west side of the A169 from Blue Bank to Saltergate Bridge, June-November 2011:

(a) number of taxa per 0.5 km,
(b) number of individuals >2m in height per 0.5 km,
(c) the total number of individuals per 0.5 km (omitting Gorse), and
(d) altitude.

Best-fit linear regression lines are included (P<0.01).

The ground flora generally appeared to be similar on both sides of the fence. There was possibly a tendency to taller vegetation and more grassland on the road side of the fence but the recorded species composition of vegetation was very similar on both sides. In all 37 ground-flora species, which included 10 mosses, were recorded in quadrats; 21 of these were found on both sides of the fence, 10 on the roadside only and six only beyond the fence. Heather was much the most important, present in all quadrats and recorded as >75% cover in 21 out of 23 roadside quadrats and in 20 out of 23 quadrats beyond the fence. Another important component was the moss *Hypnum cupressiforme* agg., which was

recorded in 22 roadside quadrats and 20 quadrats beyond the fence. Specifically this was probably Heath Plait-moss *Hypnum jutlandicum* which was found by Burch (2008) to be abundant amongst Heather on the North York Moors. The next most frequently recorded plants were Cross-leaved Heath (8 roadside quadrats and 9 beyond the fence) and Bell Heather (9 roadside quadrats and 4 beyond the fence). Comparison between quadrats was made using de-trended correspondence analysis (Kent, 2012). This is a multivariate statistical method that compared quadrats on the basis of all species and their Braun-Blanquet abundance scores. The analysis confirmed that quadrats that were adjacent but on opposite sides of the fence tended to be similar whereas quadrats at different distances along the road tended to differ. Thus each side of the fence did not have its own distinct ground flora; rather the vegetation was similar on both sides of the fence but changed along the road, presumably in response to change in variables such as soil quality, slope and wetness.

Trees and shrubs in the environs of the A169 – potential sources of seed

Although the Heather moorlands of the North York Moors are essentially treeless there are contiguous stands of established trees and shrubs. There are enclosed pastures with hedgerows, areas of broadleaved woodland and shrub, scattered plantings of broadleaved and coniferous trees and, most conspicuous, extensive areas of coniferous plantation forest. Established trees and shrubs in the environs of the A169 are a potential source of seeds for colonization of the roadside. Sites with established trees and shrubs within 1.0km of the road between the top of Blue Bank and Saltergate Bridge were surveyed in September and October 2011 and May 2012. The relevant sites were: scrub, woodland and hedgerows within 1.0km of the top of Blue Bank; scattered trees and woodland in the Eller Beck Valley; woodland, plantation and hedgerows within 1.0km of Saltergate Bridge.

Thirty-seven tree and shrub species were recorded within 1.0km of the road (Table 2); most were in the neighbourhood of Blue Bank (37 species) while 13 were found in the Eller Beck Valley and 23 in the neighbourhood of Saltergate Bridge. The 37 species found in the 1.0km environs included almost all (20 out of 24) of those that have colonized the roadside.

Regeneration of trees and shrubs in Dalby Forest – a more favourable habitat

The regeneration of trees and shrubs in the part of Dalby Forest that had been clear-felled in 1996 was studied to allow comparison of regeneration in a potentially more favourable habitat with that alongside the A169. The 3600ha of Dalby Forest represents part of the widespread coniferous afforestation within the North York Moors National Park area that was begun around 1921 (Perry, 1983). Dalby Forest and its history are described by Rushton & Walker (2009). The principal plantation trees are Sitka Spruce, Hybrid Larch *Larix × marschlinsii* and Japanese Larch *Larix kaempferi*, Scots Pine, Douglas Fir *Pseudotsuga menziesii* and Corsican Pine *Pinus nigra* but there are lesser stands and scattered individuals of many other conifers and also significant areas of diverse broadleaved trees. Thus a group of Hull University students identified 18 conifers and 27 broadleaved trees during a morning's walk in the forest (Goulder & Scott, 2009).

Table 2. Trees and shrubs recorded at sites within 1.0km of the A169; September-October 2011 and May 2012

Species of tree/shrub	Scrub, woodland and hedgerows within 1.0km of the top of Blue Bank	Scattered trees and woodland in Eller Beck Valley	Woodland, plantation and hedgerows within 1.0km of Saltergate Bridge
Abies grandis (Giant Fir)	+	-	-
Acer campestre (Field Maple)	+	-	-
*Acer pseudoplatanus** (Sycamore)	+	+	+
Aesculus hippocastanum (Horse-chestnut)	+	-	-
Alnus glutinosa (Alder)	+	+	+
*Betula pendula** (Silver Birch)	+	+	+
*Betula pubescens** (Downy Birch)	+	+	+
Corylus avellana (Hazel)	+	+	+
*Crataegus monogyna** (Hawthorn)	+	+	+
*Cytisus scoparius** (Broom)	+	-	-
Fagus sylvatica (Beech)	+	-	+
*Fraxinus excelsior** (Ash)	+	+	+
*Ilex aquifolium** (Holly)	+	-	+
Larix sp. (larches)	+	-	+
Malus pumila (Apple)	+	-	-
*Picea abies** (Norway Spruce)	+	-	+
*Picea sitchensis** (Sitka Spruce)	+	-	+
*Pinus contorta** (Lodgepole Pine)	+	+	+
*Pinus sylvestris** (Scots Pine)	+	+	+
Prunus avium (Wild Cherry)	+	-	+
Prunus domestica (Plum)	+	-	-
*Prunus spinosa** (Blackthorn)	+	-	+
*Quercus petraea** (Sessile Oak)	+	-	+
*Quercus robur** (Pedunculate Oak)	+	+	+
Ribes sanguineum (Flowering Currant)	+	-	-
Ribes uva-crispa (Gooseberry)	+	-	-
*Rosa canina** (Dog-rose)	+	-	+
*Salix alba** (White Willow)	+	-	-
*Salix caprea** (Goat Willow)	+	-	+
*Salix cinerea** (Grey Willow)	+	+	+
Sambucus nigra (Elder)	+	-	+
*Sorbus aucuparia** (Rowan)	+	+	+
Symphoricarpos albus (Snowberry)	+	-	-
Syringa vulgaris (Lilac)	+	-	-
Taxus baccata (Yew)	+	-	-
Thuja plicata (Western Red-cedar)	+	-	-
*Ulex europaeus** (Gorse)	+	+	-
Number of taxa	37	13	23

*Also recorded alongside the A169 between the top of Blue Bank and Saltergate Bridge.

(+) = present, (-) = not recorded.

The study site was at Haygate, about 9km south of Saltergate Bridge, in an area of forest with a complicated history (Brian Walker, pers. comm.). The area is more or less level and is at an altitude of about 150m. There are Neolithic earthworks and the site may have been heath or Rabbit warren in the 18th century. In the 19th century there was possibly pine plantation which was felled in the early 20th century and replanted with Scots Pine and larch by the Forestry Commission in the 1930s. In 1996 trees were clear-felled in parts of this pine and larch plantation to create nine circular clearings, each about 45m diameter. In May and June 2012 the trees and shrubs that had regenerated in two of these clearings over 16 years were recorded. A 10m radius (area $314m^2$) circular quadrat was marked out in each clearing and all living trees and shrubs were recorded. Individuals >2m height were recorded separately while dead trees/shrubs, possibly killed by deer or squirrel damage, were ignored. Low-growing heathland woody plants (Heather, Bilberry and brambles) were also ignored.

It was very evident that there had been substantial regeneration of trees in the clearings. By summer 2012, trees and shrubs had regrown to the extent that it was difficult to push through the regrowth and walk across the clearings. Nine tree taxa were recorded in the quadrats (Table 3) the most abundant being larch, followed by birch and Rowan. Tree density was high; 191 individuals (of which 151 were >2m) were recorded in 10m radius Quadrat 1 (centred at SE85158574) and 222 individuals (148 >2 m) were recorded in Quadrat 2 (centred at SE85218581). This gave an average overall density of 6577 trees ha^{-1} of which 4761 trees ha^{-1} (72%) were more than 2m in height.

Table 3. Number of trees and shrubs recorded May-June 2012 in 10m radius circular quadrats in areas of Dalby Forest clear-felled in 1996

Trees & shrubs	***Quadrat 1** >2m height	**†Quadrat 2** >2m height	**Total**
Abies grandis (Giant Fir)	0	0	1
Betula pendula (Silver Birch)	28	39	12
Betula pubescens (Downy Birch)	19	23	26
Fagus sylvatica (Beech)	1	1	2
Ilex aquifolium (Holly)	0	3	0
Larix sp. (larches)	80	85	79
Pinus sylvestris/contorta (Pine)	3	3	0
Quercus robur (Pedunculate Oak)	9	12	10
Sorbus aucuparia (Rowan)	11	25	18
Total numbers	151	191	148
Tree density (per hectare)	4809	6083	4713

*Quadrat 1 centred at SE85158574; †Quadrat 2 centred at SE85218581. Area of quadrats = $314m^2$.

The ground flora of the clearings appeared to be succumbing to shading although Bilberry and Wavy Hair-grass *Deschampsia flexuosa* persisted with Purple Moor-grass *Molinia caerulea* in wetter areas. Broad Buckler-fern *Dryopteris dilatata* was abundant in places and bryophytes were conspicuous and diverse with Heath Plait-moss being the most abundant.

The ridges and furrows of 1930s ploughing and bryophyte-colonized stumps of the trees felled in 1996 were also evident

Discussion

For trees and shrubs to colonize upland heath following the exclusion of sheep requires a source of seeds. There are established trees and shrubs within the environs of the A169. Thirty-seven species were found within 1.0km of the A169 (Table 2) and since 20 of the 24 that were recorded along the roadside (Table 1) were amongst these it is likely that the established trees and shrubs in the neighbourhood were the principal source of seeds for regeneration. The seeds of some are likely to have been carried to the roadside by wind (e.g. birch, Ash, Sycamore, pine) while others are liable to have been spread by birds (e.g. Rowan, Dog-rose, Holly, Hawthorn). This suggestion is supported by the tendency to greater species richness and abundance of colonizing roadside trees closer to Blue Bank (Fig. 1), where there is greatest diversity and substantial abundance of established trees and shrubs within the 1.0km environs of the road (Table 2). Furthermore, the secondary increases in species richness at 6.5-7.0km and 7.5-8km south of Blue Bank (Fig. 1) were close (1.0km or less) to the established tree and shrub community of the Eller Beck Valley. A parallel to these observations is that during natural re-colonization of clear-felled forest in Sweden the abundance of tree seedlings decreased further away from seed-producing mature trees (Ackzell, 1992).

Road traffic may also have contributed to the dispersal of tree seeds along the A169. Seeds can potentially be carried for considerable distances trapped in vehicle bodywork or tyres before being released at the roadside. Zwaenepoel, Roovers & Hermy (2006) found Downy Birch amongst 33 species of seedlings that they germinated in mud collected from car bodies in Belgium. Furthermore, when Von der Lippe & Kowarik (2007) germinated the seed rain collected in long road tunnels in Germany, and therefore uncontaminated by seeds from proximate roadside vegetation, they found that seeds of Silver Birch were the third most frequent amongst a total of 204 species collected overall. Moreover the composition of the tunnel seed rain reflected the regional rather than the roadside flora adjacent to the tunnels; hence dispersal was over long distances (several kilometres) rather than local. A further potential source of tree propagules along the A169 is fly-tipping of garden waste. The garden shrub, Wall Cotoneaster *Cotoneaster horizontalis*, between 2.5-3.0km was accompanied by a pink-flowered cultivar of Columbine *Aquilegia vulgaris* and a large-leaved lady's-mantle *Alchemilla* sp., both obviously of garden origin; elsewhere Pampas-grass *Cortaderia selloana* was established at the roadside.

As the roadside trees and shrubs along the A169 have become more numerous and have matured to the extent of producing their own seed, it is possible that some of the younger individuals have originated as seed from plants already established along the roadside. This may, for example, be the case with Grey Willow where it has extensively colonized the ditch between 0.5-1.0km south of Blue Bank, and is certainly so for Gorse between 0-0.5km. It is also possible that some of the roadside trees have been planted. There is, however, little

evidence of this, although many of the trees within the wider 1.0km environs of the road have clearly been planted. Four Juniper *Juniperus communis* plants that survive in rabbit guards, close to aged and possibly indigenous Juniper shrubs at 2.5-3km, are an exception.

The rate of colonization by trees and shrubs along the A169 roadside after nearly 25 years of sheep exclusion, an overall average of 27 individuals per hectare (excluding Gorse), is shown to be extremely low by comparison with the regeneration rate in clear-felled areas of Dalby Forest. There, after just 16 years of regeneration, a mean density of 6577 individuals per hectare had been achieved. This density is commensurate, for example, with a mean of 7133 seedlings per hectare of mainly Scots Pine, Norway Spruce, Downy Birch and Silver Birch achieved by natural regeneration 10 years after clear-felling of forest in Sweden (Ackzell, 1994). Furthermore, growth rates were much less alongside the A169 where only 21% of individual trees and shrubs were >2m in height compared with 72% in the clearings at Dalby Forest.

Several potential and not mutually exclusive reasons for the exceptionally low rates of colonization and growth along the A169 are considered below.

Seed availability. Dimbleby (1953) showed that Scots Pine and Downy Birch colonized open moorland in North Yorkshire only when mature trees to supply seeds were obviously present. Mature trees and shrubs are absent in the wider environs of much of the A169 (i.e. within 1.0km), even though there is considerable species richness where they are present (Table 2). Shortage of seeds is likely to limit colonization. This is supported by the decrease in abundance southwards away from the locally abundant trees and shrubs in the vicinity of Blue Bank (Fig. 1). The rapid regeneration at Dalby Forest, in contrast, was in clearings surrounded by mature trees. Regeneration in clear-felled forest is known to be dependent upon mature seed-bearing trees retained in the neighbourhood (Malcolm, Mason & Clarke, 2001) and decreases with distance away from the edge of seed-bearing stands (Hanssen, 2003).

Ground vegetation. Heather-dominated ground flora, as along the A169, is well known to be inimical to germination and development of tree seedlings. Causes of this inhibition include nutrient impoverishment and harmful allelopathic effects (Mallik, 1995); Heather roots produce toxins that may interfere with the mycorrhizal fungi of tree roots (Robinson, 1972; Jalal & Read, 1983). Indeed, some of the earliest work on inhibition of trees by Heather was done in the North York Moors area by Weatherell (1953), who showed that elimination of Heather by mulching or hoeing reversed check in seedlings of Sitka Spruce, Norway Spruce and Lawson's Cypress *Chamaecyparis lawsoniana*. Suppression by ericaceous ground flora is likely to have contributed to the low density and slow growth of trees along the A169. In the Dalby Forest clearings, in contrast, there was little Heather in the ground flora.

Ground Disturbance. The inimical effects of heathland ground flora can be countered by the physical disturbance of the substratum. Thus Dimbleby (1953) showed that regeneration of Scots Pine and Downy Birch on the North York Moors occurred when the ground had been disturbed, especially after burning, and diminished when ground-vegetation cover re-established. Similarly, Gimingham (1978) described how birch seedlings were successful on Dinnet Moor, Aberdeenshire, only subsequent to burning of Heather. The heathland between the fence and carriageway along the A169 is not subject to burning while tree colonization beyond the fence, where there is burning, is presumably stopped by sheep. It is notable that many of the trees and shrubs that did manage to establish along the A169 were associated with the unstable habitat of the roadside ditch. Willows tended to grow in the ditch and Dog-rose and Hawthorn on its sides. It was principally birch, Rowan and pine seedlings that managed to establish sparingly amidst the heath vegetation. Scarification, to break up ground flora and expose mineral soil, encourages natural regeneration in forest habitats, of, for example, Scots Pine (Ackzell, 1993) and Corsican Pine (Kerr, 2000). Certainly, the felling and removal of mature trees will have caused the substantial ground disturbance in the Dalby Forest clearings that is likely to have encouraged their rapid re-colonization by trees.

Soil quality. The moorland soils tend to be sandy, podsolized with an iron pan and nutrient, especially phosphate, deficient (Perry, 1983); deep ploughing to break down the pan is a prerequisite of successful commercial afforestation (Dent, 1972). Thus poor soil conditions along the A169 are liable to restrict tree growth. In contrast, the clearings at Dalby Forest will have benefitted in the 1930s from the ploughing and fertilization that is part of the North Yorkshire forest regime (Perry, 1983) and from subsequent forest maintenance. Hence, when trees were cleared in 1996 the soil was likely to have been more favourable than it is alongside the A169.

Felling and dieback. There is some evidence of felling or coppicing of trees that have colonized alongside the A169. This is notable at 11.0-11.5km south of Blue Bank where two pine stumps, diameter 10cm and 20cm, were observed and between 10.5-11.5km where at least 13 Rowan had been sawn off at ground level; regeneration from the substantial stumps was <2m in height. Some of the pine and spruce trees were showing signs of yellowing and dieback; occasional dead pine and spruce were observed but not counted.

Exposure. Colonizing trees are more exposed to wind and extreme weather alongside the A169 than in the sheltered Dalby Forest clearings. This may be important because, although there was no (negative) relationship between colonization and altitude along the A169, all the roadside trees were more exposed than those at Dalby Forest. Altitude as such is probably not important considering that the tree line in the Cairngorm Mountains, mainly Scots Pine and birch, frequently runs at about 490m and potentially extends to >600m (Pears, 1967), altitudes that are much in excess of the maximum of 288m reached by the A169.

Although colonization alongside the A169 has been slow over the 25 years or so since sheep were excluded, trees and shrubs have nevertheless reached a state of abundance and size that makes them noticeable to travellers. This is a process which, if left alone, will continue and may speed up as trees that have established become mature and themselves produce seeds. Although highways have many negative impacts upon wildlife (Forman & Alexander, 1998; Spellerberg, 1998) the roadside flora of North Yorkshire is an attractive asset (Atherden & Sykes, 2012) and furthermore travellers appear to appreciate roadside vegetation, being especially appreciative of natural-looking vegetation backed by trees and shrubs (Akbar, Hale & Headley, 2003). The highway authority for the A169 will at some time need to establish a management policy for the trees and shrubs along the A169. Ideally the diverse mix of native and interesting exotic trees will be respected and there will be sound management reasons (e.g. road safety, preservation of vistas) for any decisions to remove trees or shrubs.

Acknowledgements

I am grateful to Brian Walker for showing me the Dalby Forest clearings and for reading the manuscript. I also thank Margaret Atherden for her suggestions for improvement of the manuscript.

References

Ackzell, L. (1992) Naturally established seedlings on an artificially regenerated area in Northern Sweden. *Scandinavian Journal of Forest Research*, 7: 485-495.

Ackzell, L. (1993) A comparison of planting, sowing and natural regeneration for *Pinus sylvestris* (L.) in boreal Sweden. *Forest Ecology and Management*, 61: 229-245.

Ackzell, L. (1994) Natural regeneration on planted clear-cuts in boreal Sweden. *Scandinavian Journal of Forest Research*, 9: 245-250.

Akbar, K.F., Hale, W.H.G. and Headley, A.D. (2003) Assessment of scenic beauty of the roadside vegetation in northern England. *Landscape and Urban Planning*, 63: 139-144.

Atherden, M.A. (1976a) Late Quaternary vegetational history of the North York Moors. III. Fen Bogs. *Journal of Biogeography*, 3: 115-124.

Atherden, M.A. (1976b) The impact of late prehistoric cultures on the vegetation of the North York Moors. *Transactions of the Institute of British Geographers, New Series*, 1: 284-300.

Atherden, M.A. (1992) *Upland Britain: A Natural History*. Manchester University Press, Manchester.

Atherden, M.A. (1999) The vegetation history of Yorkshire: a bog-trotter's guide to God's own county. *The Naturalist*, 124: 137-156.

Atherden, M.A. and Simmons, I.G. (1996) The landscape. In *The North York Moors: Landscape Heritage,* ed. Spratt, D.A and Harrison, B.J.D., 11-27. North York Moors National Park, Helmsley. (Originally published 1989 by David & Charles, Newton Abbot).

Atherden, M.A. and Sykes, N. (2012) *Wild Flowers on the Edge: the Story of North Yorkshire's Road Verges*. PLACE, York.

Burch, J. (2008) The relationship of bryophyte regeneration to heather canopy height following moorland burning on the North York Moors. *Journal of Bryology*, 30: 208-216.

Dent, T.V. (1972) Forestry on the North York Moors. In *Forestry Commission Guide: North Yorkshire Forests*, third edition, ed. Edlin H.L., 5-15. HMSO, London.

Dimbleby, G.W. (1953) Natural regeneration of pine and birch on the heather moors of North-East Yorkshire. *Forestry*, 26: 41-52

Dimbleby, G.W. (1962) The development of British heathlands and their soils. *Oxford Forest Memoirs,* 23: 7-121.

Forman, R.T.T. and Alexander, L.E. (1998) Roads and their major ecological effects. *Annual Review of Ecology and Systematics*, 29: 207-231.

Gimingham, C.H. (1978) *Calluna* and its associated species: some aspects of co-existence in communities. *Vegetatio*, 36: 179-186.

Goulder, R. and Scott, G.W. (2009) Field study of plant diversity: extending the whole-class knowledge base through open-ended learning. *Bioscience Education*, 14, pp. 9. (www.bioscience.heacademy.ac.uk/journal/vol14/beej-14-1.pdf).

Hanssen, K.H. (2003) Natural regeneration of *Picea abies* on small clear-cuts in SE Norway. *Forest Ecology and Management*, 180: 199-213.

Jalal, M.A.F. and Read, D.J. (1983) The organic acid composition of *Calluna* heathland soil with special reference to phyto- and fungitoxicity. *Plant and Soil*, 70: 257-272.

Kent, M. (2012) *Vegetation Description and Data Analysis: a Practical Approach,* second edition. Wlley-Blackwell, Chichester.

Kerr, G. (2000) Natural regeneration of Corsican pine (*Pinus nigra* subsp. *laricio*) in Great Britain. *Forestry*, 73: 479-488.

Malcolm, D.C., Mason, W.L. and Clarke, G.C. (2001) The transformation of conifer forests in Britain – regeneration, gap size and silvicultural systems. *Forest Ecology and Management*, 151: 7-23.

Mallik, A.U. (1995) Conversion of temperate forests into heaths: role of ecosystem disturbance and ericaceous plants. *Environmental Management*, 19: 675-684.

Pears, N.V. (1967) Present tree-lines of the Cairngorm Mountains, Scotland. *Journal of Ecology*, 55: 815-830.

Perry, D.J. (1983) North Yorkshire forests. *Forestry*, 56: 75-86.

Robinson, R.K. (1972) The production by roots of *Calluna vulgaris* of a factor inhibitory to growth of some mycorrhizal fungi. *Journal of Ecology*, 60: 219-224.

Round, E. (2012) Fen Bog. In *Discover Yorkshire's Wildlife: Your Guide to Yorkshire and Sheffield Wildlife Trusts' Nature Reserves*, ed. Leadley J. and Richards J., 76-77. Yorkshire Wildlife Trust, York.

Rushton, J. and Walker, B. (2009) *Dalby: Valley of Change*, second edition. Newby Books, Scarborough.

Spellerberg, I.F. (1998) Ecological effects of roads and traffic: a literature review. *Global Ecology and Biogeography Letters*, 7: 317-333.

Von der Lippe, M. and Kowarik, I. (2007) Long-distance dispersal of plants by vehicles as a driver of plant invasions. *Conservation Biology* 21: 986-996.

Weatherell, J. (1953) The checking of forest trees by heather. *Forestry*, 26: 37-40.

Zwaenepoel, A., Roovers, P. and Hermy, M. (2006) Motor vehicles as vectors of plant species from road verges in a suburban environment. *Basic and Applied Ecology*, 7: 83-93.

Tansy Beetle conservation: Yorkshire data, national implications

Geoff Oxford[1] **and Matt Millington**[2,3]

1 Department of Biology, University of York, Wentworth Way, Heslington, York YO10 5DD geoff.oxford@york.ac.uk

2 Waste and Countryside Services, North Yorkshire County Council, County Hall, Northallerton DL7 8AH

3 This paper is written on behalf of the Tansy Beetle Action Group (TBAG)

Introduction

The Tansy Beetle *Chrysolina graminis* (Linnaeus, 1758) is a large (c.10mm), green, iridescent leaf-beetle (see Plate IV, centre pages) which is currently confined in the British Isles to the banks of an approximately 45km (27.5 mile) section of the Yorkshire Ouse centred on York. Its common name refers to one of its major food plants (Tansy *Tanacetum vulgare*) and the one almost exclusively eaten around York. The ecology, behaviour and life-cycle of the Tansy Beetle have been described previously (Oxford *et al.*, 2003; Chapman *et al.*, 2006). Its past distribution in the British Isles is not easy to determine because of possible confusion with the almost identical Mint Beetle *C. herbacea*. Although the adults of these two leaf-beetles differ in rather subtle ways, the larvae are quite distinct (Chapman *et al.*, 2006). Cox (2007) provided a map of past records, although at least some may not have been properly verified. For example, one from Redmoor in Cornwall almost certainly refers to *C. herbacea* (G. S. Oxford, unpublished) while another from St Mary's on the Isles of Scilly is a result of a data-transfer error at the Biological Records Centre (M. L. Denton, pers. comm. – the record was in fact of *C. banksi*). A determined trawl of museum collections is required in order to appreciate fully the beetle's previous range.

The Tansy Beetle was certainly found in the East Anglian Fens until a few decades ago. Howard Mendel (personal communication *via* D. Sivell) recorded it at Wicken Fen in the second half of the 1980s, apparently the last sighting there. This observation post-dates the 1981 "last record" mentioned in Oxford *et al.* (2003). The Cambridge University Zoological Museum has specimens from Woodwalton Fen collected between 1956 and 1975 by H. E. Henderson (S. Warrington, pers. comm.). Another, undated, record in the Cambridge Museum is from Whittlesey Mere, near Peterborough (S. Warrington, pers. comm.). The reduction in the beetle's distribution in the British Isles, particularly its apparent loss from the Fens, and similar trends in numbers and occupancy across its Palaearctic range (Sivell, 2003) make the York population increasingly important for its long-term conservation. Even on the Yorkshire Ouse, its distributional limits and numbers fluctuate dramatically from year to year (see below). The species is listed as Nationally Scarce A (Hyman and Parsons, 1992) but Oxford *et al.* (2003) considered that this designation woefully underestimated the plight of *C. graminis*: it probably now merits Endangered or Vulnerable status according to IUCN criteria.

In 2007 the Tansy Beetle was added to the UK BAP Priority Species list (Anon, 2007) and this put an onus on statutory bodies with jurisdiction over those sections of the River Ouse with

Tansy Beetle populations to consider the beetle and its habitat requirements as part of their environmental strategies. The beetle was highlighted as needing conservation action in the local BAPS of Hambleton District Council, City of York Council and Selby District Council, the three relevant local authorities in Yorkshire. Representatives of four organisations – the University of York, North Yorkshire County Council (NYCC), City of York Council (CYC) and the Environment Agency (EA) – met on February 27th, 2008, and agreed to form a Tansy Beetle Action Group (TBAG). The overall aim of the Group was to enhance the conservation of the beetle by sharing knowledge and expertise and by co-ordinating activities. Subsequently, a number of other organisations joined TBAG (see acknowledgements). In 2009 TBAG secured a three-year grant from the SITA Trust to fund practical aspects of riparian management and to raise the profile of the Tansy Beetle and its conservation with the general public.

Here we outline the progress we have made over the first five years of TBAG, in particular (1) the undertaking and monitoring of practical conservation activities on the River Ouse and awareness raising, both funded in the main by the SITA Trust, and (2), the initiation of annual, fine-scale surveys of both the beetle and its food plant in order to understand more fully their fluctuations in time and space. Because the beetle is confined to Yorkshire, the information gathered locally is, *de facto*, of national importance. We discuss the implications of our work for securing the future survival of the Tansy Beetle in the British Isles.

Practical conservation work

The conservation work funded by the £18,500 SITA Trust grant concentrated on 11 sites across the beetle's range and targeted three main strands of work:

- Himalayan Balsam *Impatiens glandulifera*, a highly invasive, non-native plant that shades out and replaces patches of Tansy, has been removed at a number of existing Tansy Beetle locations. Strimming and pulling over successive years have proved very effective but these efforts need to be continued as balsam recolonises very quickly.
- Willows have been coppiced along the river bank in areas where the trees were tall and dense and shading out Tansy patches. This work took place at both extant Tansy Beetle sites and at those at which the beetle had been recorded in the past. The project aimed to reintroduce Tansy and allow the beetles to recolonise.
- Yorkshire-provenance Tansy plants were purchased and planted out in historical beetle sites where the food-plant had disappeared. This was done in conjunction with the previous two forms of management, if those were believed to be the causes of Tansy loss. At some sites it was clear that overgrazing by cattle was responsible for the disappearance of Tansy. In these cases wooden enclosures (c.6 x 3m) were constructed to prevent grazing and new Tansy patches established within them.

All these conservation measures were designed to increase the number and, more importantly, the connectivity between Tansy patches along the riparian fringe. This is

crucial as Tansy Beetles rarely if ever fly in Britain and find new food-plant locations by walking. Chapman *et al.* (2007) showed that gaps of more than c.150-200m between patches disrupt this process, leading to isolated populations of beetle that are vulnerable to local extinction. The success or otherwise of these interventions will be carefully monitored during annual surveys of Tansy and beetles.

Awareness Raising

TBAG has always been keen to raise awareness of the beetle and the causes of its plight. The SITA-funded project included the design and purchase of two information boards, which were located near the National Trust property Beningbrough Hall (map reference SE513579) and at the picnic area in Fulford, York (SE608487) – well visited stretches of the riverbank where the beetle is normally found (Ref.1).

Outside of the SITA project, TBAG produced a species management sheet for Ouse riparian landowners applying for Environmental Stewardship schemes (Ref.2) and a leaflet for riparian landowners in general, concentrating on how to distinguish between Tansy and Ragwort *Jacobaea vulgaris*, a plant that is often controlled under the Weeds Act (1959) and the Ragwort Control Act (2003) (Ref.3).

Raising awareness among the general public included producing a poster for events such as the Insect Festival and the National Insect Week celebration held every two years in York. A York jewellery shop offered to produce handmade Tansy Beetle brooches for added publicity and TBAG produced a postcard of the species for sale in York shops and at events. York's Science & Innovation Grand Tour held between May and September 2012 included a large Tansy Beetle board erected on the waterfront at King's Staith in York city centre.

Surveys of beetles and their food plant

The first comprehensive survey of the River Ouse was undertaken by Calvert (1998), who searched for beetles between Linton Lock and opposite Bishopthorpe on the east bank and from Nun Monkton down to just north of Acaster Selby on the west bank. Tributaries of the Ouse were not examined. He counted beetles and mapped the locations of major Tansy clumps and identified the apparent limits of beetle populations north of York. Subsequently, two graduate students at the University of York, Duncan Sivell (2000 to 2003) and Dan Chapman (2003 to 2006) delimited what was thought to be the entire range of the beetle, although there were conspicuous gaps in their coverage and surveys were not carried out in every year (Sivell, 2003; Chapman, 2006).

The first attempt to survey comprehensively the whole section of river used by the Tansy Beetle was in 2009. A team of surveyors was established in late spring of that year comprising colleagues from the University of York, members of TBAG and a number of NYCC volunteers. Training was provided in the identification of the beetle and its food plant and of the survey protocol to be used. The latter, briefly, involved the walking of an allocated length of river bank and noting the location and approximate size (small, medium,

large, very large) of all Tansy clumps using specified criteria. Locations were geo-referenced with Garmin GPS12 or Garmin *etrex* GPS units (some of which were purchased with SITA funding). Clumps were examined for the presence or absence of beetles and, if present, the numbers were counted by slowly circumnavigating the clump or estimated using a defined scale. Surveys were carried out on warm, sunny days when previous work by Sivell (2003) had shown that approximately half the beetles in the clump are visible. The surveys were performed during a month-long window from approximately the beginning of the second week in August to the end of the first week in September, to catch the new generation of adults (Oxford *et al.*, 2003; Chapman *et al.*, 2006). Surveys have been repeated in subsequent years.

The results of these annual surveys are compiled into a detailed report where the implications of changes from one year to the next are discussed. All data are lodged with the North and East Yorkshire Ecological Data Centre (NEYEDC). Inevitably, despite training, there will be differences in the efficiency with which the various surveyors locate Tansy clumps and discover and count beetles, and there is a natural turnover of surveyors from year to year, both of which introduce an element of 'noise' to the data. However, without our dedicated band of surveyors we would have no data at all, and so these factors have to be acknowledged and borne in mind when interpreting the results. The overall distribution map of Tansy clumps and Tansy Beetles for 2012 is shown in Figure 1 and suggests that the total range of the beetle on the Ouse was similar to that in 2011 and 2010, *viz.* along c.45km of river (in 2009, the river was surveyed less completely).

However, as always, the devil is in the detail. Quantitative assessments can be made of changes in the numbers and distributions of both Tansy clumps and Tansy Beetles where the same stretches of river are monitored by the same surveyor(s) over two or more years.

Examples of distribution maps for one section of river in 2011 and 2012 are shown in Figure 2 (Plate V, centre pages) and numbers for equivalent stretches in 2010, 2011 and 2012 given in Table 1. The marked annual fluctuations in beetle locations and numbers are abundantly clear. Between the 2010 and 2011 surveys there had been, on average, a doubling in beetle counts along river stretches north of York, but numbers had plummeted to about a tenth of their 2010 value south of York. The reason for this geographical variation is not clear but seems not to be a result of flooding. A similar comparison for 2011 and 2012 showed a falling off in numbers for most stretches, irrespective of geography (Table 1), but this was not universal. Some stretches held their own while a few increased. Comparing the 2011 and 2012 results for these numerically reliable stretches, the total number of Tansy clumps located fell from 1727 to 1361, a decline of c.21%, while the proportion of these clumps occupied by beetles fell from 19% to 13.2%, a decline of some 30%. The total number of beetles counted along these same stretches dropped from 2097 in 2011 to 1101 in 2012, down by 52.5%, although this figure hides considerable variation between different parts of the river (Table 1).

Figure 1. Overview map of the distributions of Tansy clumps without beetles (white symbols) and Tansy clumps with beetles (black symbols) derived from the 2012 survey. The large grey urban area is York, with Selby on the lower edge of the map. The river distance between the most northerly and the most southerly beetle records is *c.*45 km.
Map © Crown Copyright/ database right 2012. An Ordnance Survey/EDINA supplied service.

The principal reason for the general decline between 2011 and 2012 seems to be summer flooding, with 2012 seeing the wettest summer for 100 years (www.metoffice.gov.uk/news). Mortality during the winter, when adult beetles hibernate underground, is extremely low, despite almost annual floods at that time of year (Sivell, 2003; Chapman *et al.*, 2006). However, flooding during the active season, which is approximately early April through to late September, can be devastating. There were at least eight major flood events in 2012, spread throughout the year (Figure 3).

Table 1. Comparisons of Tansy Beetle counts along stretches of river surveyed between 2010 and 2012. In all but two cases the same surveyor was involved across the three years (* and ** represent different surveyors). The river stretches are ordered north to south, with the position of York indicated. E = east bank, W = west bank.

Stretch (bank) north to south	No. of beetles counted		
	2010	**2011**	**2012**
Linton Lock to Nidd (W)	245	433	0
Linton Lock to Nidd (E)	505	939	9
Nidd to Railway Bridge (E)	32*	272**	2**
Nidd to Poppleton (W)	-	0	21
Railway Bridge to Clifton Bridge (E)	76	113	1
YORK			
York to Ring Road (W)	62	9	-
Bishopthorpe to Acaster Malbis (W)	-	167	274
Acaster Malbis to Acaster Selby (W)	1554*	79*	718**
Acaster Selby to R. Wharfe (W)	68	30	0
Naburn to Stillingfleet (E)	-	33	7
Cawood to Riccall (E)	28	20	2
Cawood to Wistow Clough (W)	12	1	1
Wistow Clough to Great Clough (W)	68	1	66

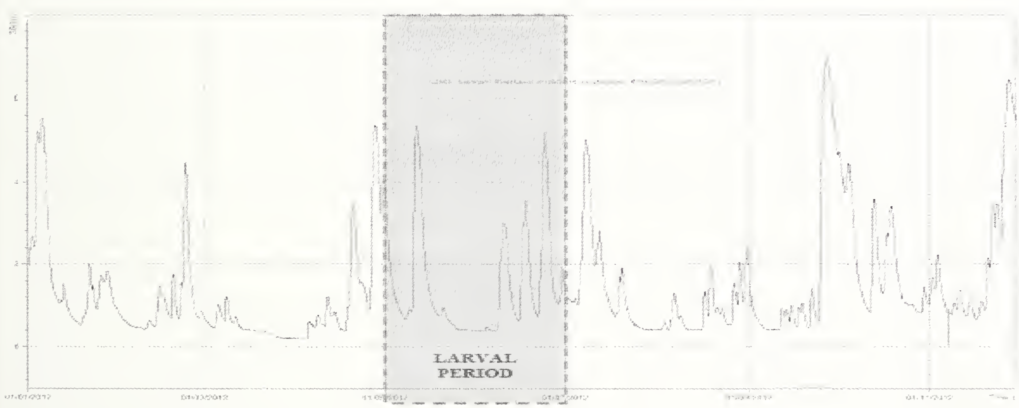


Figure 3. River levels at Moor Monkton gauging station (as metres above gauge zero) January 1st to November 29th, 2012, with the approximate Tansy beetle larval period superimposed. This figure contains Environment Agency information © Environment Agency and database right.

Those occurring between early May and late June would have coincided with the time when larvae were on the food plant (Figure 3). Larvae simply sink and drown when dislodged from foliage by flooding (Sivell, 2003; G.S.Oxford, pers. obs.). Adults may also be affected by earlier or later floods, but perhaps not to the extent expected. Beetles may become trapped at the tops of plants as floods rise (Oxford *et al.*, 2003; Sivell, 2003) and eventually float off, possibly to colonise sites further downstream. Chapman (2006) showed that, at a mark-release-resighting site on Clifton Ings, summer flooding did not result in the reduced survival of marked beetles, which moved away from the immediate riverbank and onto the flood embankment as the waters rose. He also observed beetles climbing down the stems of plants into the floodwater, possibly to enter the soil where they may survive in air pockets (Chapman, 2006; Chapman *et al.*, 2006).

Without local information on river levels and details of the riparian topography, or direct observation during inundation, it is not possible to state which flood events seriously affected specific stretches of riverbank. Some of the populations that showed an increase or at least held their own in 2012 may have been on slightly higher ground, but this does not apply to all of them. For example, the most southerly site in Table 1, just to the north of Selby, will have suffered from flooding and the exacerbating effects of tidal flow, and yet the beetle count in just a few adjacent Tansy clumps immediately next to the riverbank increased dramatically compared to that in 2011. Other, as yet unknown, factors must be involved.

These annual surveys, together with the earlier mapping of beetles by Calvert (1998), suggest that the overall range of the beetle on the River Ouse fluctuates to some extent from year to year but that, over the medium term, it is relatively stable. Over the longer term, however, the range has almost certainly contracted (Sivell, 2003; Chapman *et al.*, 2006). An experimental introduction on the east bank near Newton-on-Ouse (Figure 2) in 2005 successfully established the beetle on a stretch occupied around the middle of the 20th century but from which it had been lost (Calvert, 1998; Chapman, 2006; Chapman *et al.*, 2006). Tansy on the west bank (Figure 2) was not, unfortunately, surveyed until 2010 and so it is not known whether the beetle populations there pre-date the re-introductions on the opposite side of the river. Figure 4 shows a schematic diagram (not to scale) of the range changes north and south of York on the east and west banks of the Ouse between 2011 (2010 on the east bank south of York) and 2012. The overall length of river occupied marginally increased (by some 440m) between the two years, but this result is due to the recording of single individuals in Tansy clumps at the range margins. It is a matter of chance whether or not beetles at such low densities are spotted, which makes the determination of overall range rather unreliable The apparent contraction on the east bank south of York also rests on a very small number of beetles found in 2010. However, it is undoubtedly the case that there has been a major reduction in beetle populations along this stretch over the past 10 years or so as a result of overgrazing by cattle. The significant loss of ground on the west bank north of York is abundantly clear from Figure 2 and, were it not for the discovery of an apparently new but relatively small population of beetles c.1.5km south of the River

Nidd confluence, the northern limit on this bank would have contracted by an additional 3.5km (i.e. c.7.75km in total).

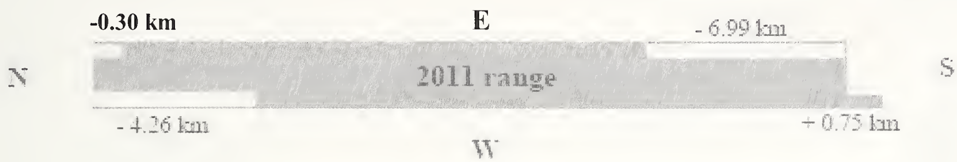


Figure 4. A schematic diagram showing changes to the northern (N) and southern (S) limits of the Tansy Beetle on the east (E) and west (W) banks of the River Ouse between 2011 and 2012 (not to scale). The range in 2011 (2010 for the east bank to the south) is represented by the broad grey bar. Range expansion in 2012 is shown by the narrow grey bar and contractions by the white bars (see text for more details).

Discussion and conclusions

The SITA-funded conservation work was very successful in securing a number of riverbank sites for existing beetle populations and creating new sites for beetles to colonise, thus expanding the metapopulation-like network along the Ouse. However, the annual surveys of the beetle's range have highlighted the fact that, despite the positive work on safeguarding the beetle, factors out of our control could still threaten the species' survival.

The most notable element affecting beetles on a year-by-year basis is flooding. Instrumental river-level records (annual maximum) for York began in 1877, with more sporadic documentary sources dating back to 1263 (Radley & Simms, 1970; Longfield, 1998; Macdonald & Black, 2010; Macdonald, 2012). This represents the longest set of flood data in the entire country – the Viking record (Lane, 2003). Using the Viking record, Lane (2003) analysed counts of the number of water level peaks over a threshold of 8.058m above Ordnance Datum (AOD) for each decade between 1881 and 2000. He showed that the number of floods and the decadal mean annual maximum flood have both tended to increase from the 1940s onwards. The cause(s) of these increases are less easy to establish (Lane, 2003; Fowler, 2005). What is of particular concern for the conservation of the Tansy Beetle is whether the seasonality of flood events is changing and, especially, whether summer flooding is increasing or decreasing. Macdonald (2012) recently addressed this question by comparing flood seasonality at York for the last 200 years, using normalised data to take account of the imbalance in the number of recorded floods between the 19th and 20th centuries. He concluded that there had been a considerable increase in February-March floods but a decrease in those occurring in June-July during the 20th century. April-May and August-September flooding showed little change. Seasonality of annual maxima floods during 50-year (normalised) periods and the distributions of floods above a threshold (8.75m AOD) in the same 50-year periods showed that these trends were also evident between the first and second halves of the 20th century. The earlier work of Longfield (1998) suggested an increase of peak-over-threshold floods during March to May from the 1960s onwards. Different authors therefore come to slightly different conclusions.

The historical data suggest that summer flooding is becoming less frequent on average rather than more, although there might be some increases during March to May. There is, of course, a highly stochastic element in the occurrence of flood events and, from the Tansy Beetle's perspective, the occasional large flood at the wrong time in its life cycle can be devastating, as illustrated for many sites during 2012. A similar rash of summer floods in 2013 might well seal the beetle's fate across much of its range on the Ouse. Of course, major flooding has happened in the past and the beetle has survived. In historical times, however, the floodplains of the Ouse were probably less intensively managed and the beetle's distribution may have extended further inland, possibly onto slightly higher ground less affected by flood-water. Rawcliffe Meadows may provide a modern-day example of this phenomenon. Currently, the majority of beetle populations are constrained by grazing and cultivation to a narrow strip of riverbank where the effects of floods are maximised.

The vulnerability of the species has been recognized by TBAG, which has taken three approaches to tackle the problem. First, we have established and are monitoring the success of large patches of Tansy and beetles away from the Ouse floodplain but nevertheless close to York. These beetle 'arks' will serve as insurance in the event of catastrophic summer floods. Secondly, a number of zoos and wildlife visitor centres have expressed an interest in captive-breeding Tansy Beetles as an illustration of invertebrate conservation in Britain and also as a source of material for possible future introductions. These would act as more distant ark sites. Thirdly, and most importantly, we are exploring the feasibility of re-introducing Tansy Beetles to former locations away from the Ouse corridor; the obvious contenders are within the East Anglian Fens as part of the Great Fen Project and the Wicken Vision.

In conclusion, over the past 15 years we have made significant progress in understanding the ecological and conservation requirements of the Tansy Beetle. Work at the University of York has furnished much of our ecological knowledge of this species while the creation of the Tansy Beetle Action Group in 2008 served to focus attention on what conservation actions needed to be taken. By sharing responsibilities across its constitutive members, TBAG has succeeded in achieving, or at least initiating, many of its original aims. The next five years should see major advancement in our attempts to secure the future of this iconic beetle. We hope that, in time, the Tansy Beetle will no longer solely be known as the 'Jewel of York'.

Summary
We report on the progress made during the first five years of the Tansy Beetle Action Group (TBAG) towards (a) practical conservation, (b) monitoring the distributions and numbers of the beetle and its food plant and (c) identifying key threats to the species' future. A SITA grant enabled habitat management to be implemented along specific sections of the River Ouse in order to protect the beetle's food plant and extend its range. Educating the general public about invertebrate conservation has also been an important feature of this project. Annual fine-scale surveys of both the beetle and its food plant have been initiated and

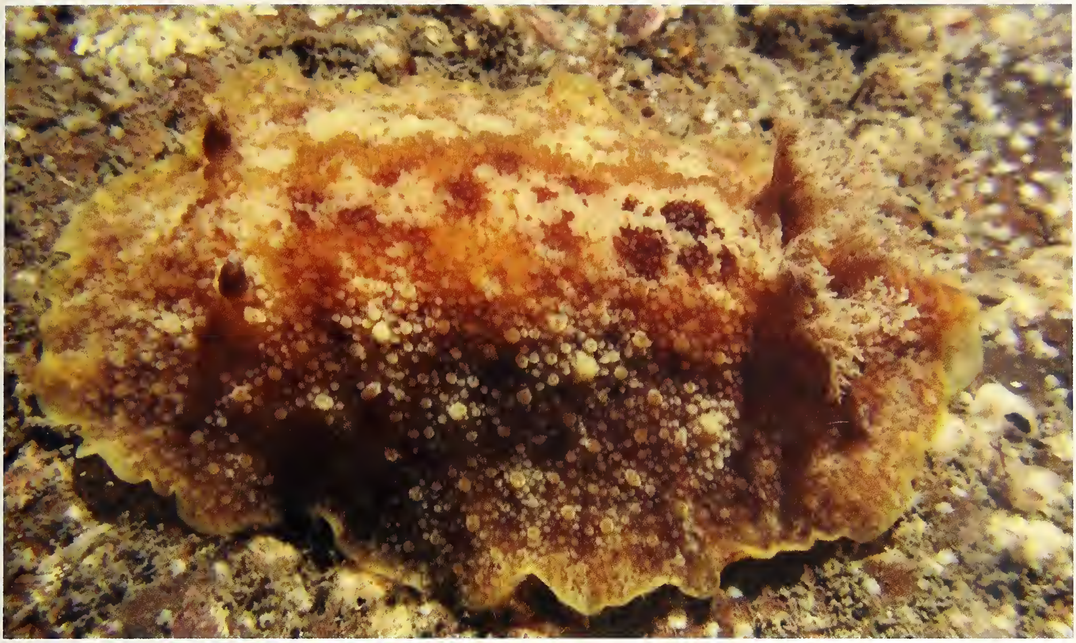


Plate I. Species which have changed their abundance off Yorkshire's coast (see p82):

Above: Sea slug *Geitodoris planata,* a new species to the Yorkshire coast, from a rock pool near Scarborough.
D. Whittaker

Left: Common Prawn. *P.Lightfoot*

Below: Angular Crab. *P.Lightfoot*

Plate II. Sparse colonization by trees along the A169, May-June 2011 (see p101). Heather dominates the ground flora between the sheep fence on the left and the road except for the ditch and mown verge alongside the carriageway;
Left: Birch, *Right*: Pine. *R.Goulder*

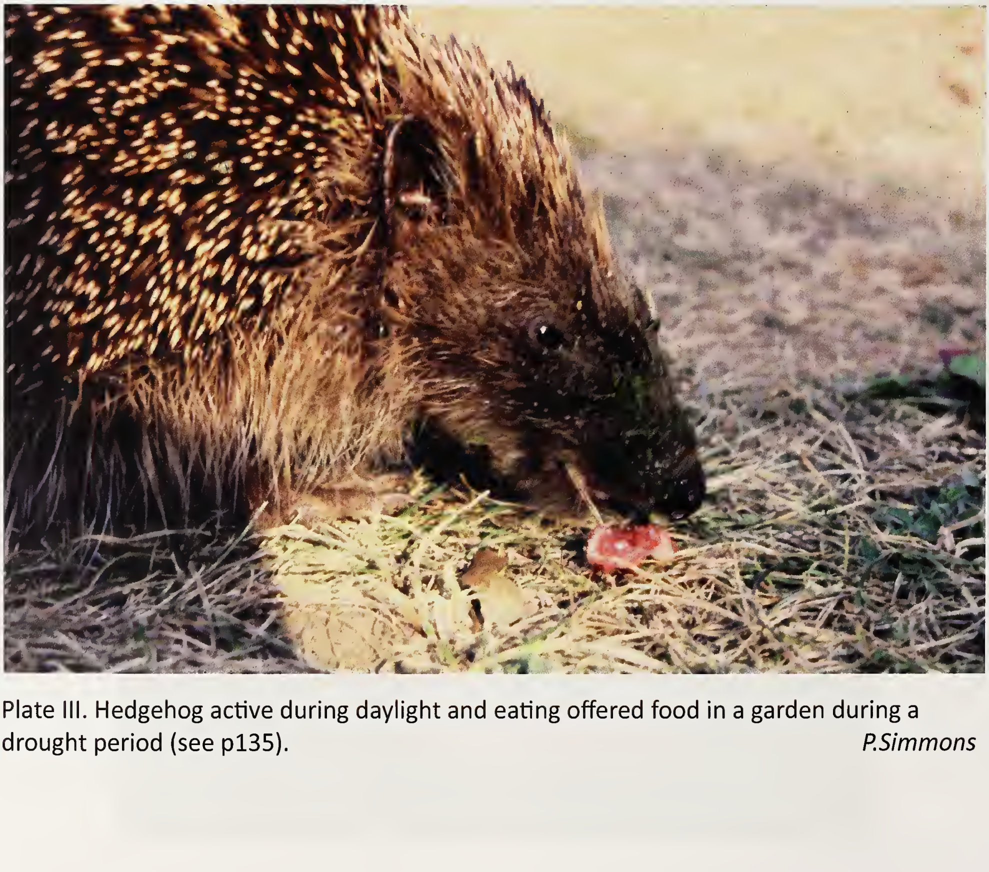


Plate III. Hedgehog active during daylight and eating offered food in a garden during a drought period (see p135). *P.Simmons*

Plate IV Tansy Beetle showing its iridescence (see p112). *Geoff Oxford*

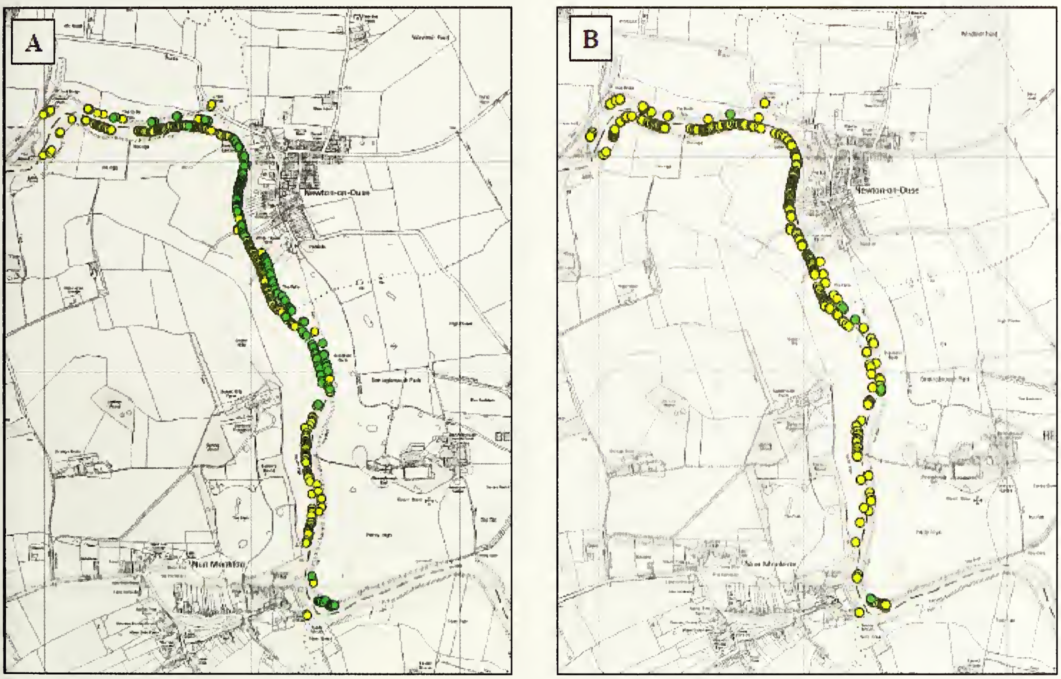


Plate V (Figure 2 - see p115). Comparison of the distributions of Tansy clumps without beetles (yellow symbols) and Tansy clumps with beetles (green symbols) at the northernmost edge of the beetle's range in 2011 (A) and 2012 (B). These stretches are represented by the 'Linton Lock to Nidd W' and 'Linton Lock to Nidd E' entries in Table 1 (p117). The village in the centre top is Newton-on-Ouse, and that to the bottom left Nun Monkton. Grid lines are Ordnance Survey one kilometre squares. Map © Crown Copyright/database right 2012. An Ordnance Survey/EDINA supplied service.

Plate VI. Images from the YNU Flickr webpages (See p 81).

Clockwise from right:
Treecreeper in the hand. *Ian Andrews*
Dog Rose. *Mervyn Nethercoat*
Bedstraw Hawkmoth, Kilnsea. *'Petros Pete'*
Male Adders fighting. *John Sadler*
Figwort Weevil. *Joe Botting*

We know there are many good photos of Yorkshire wildlife out there - please add them to the YNU Flickr pages.

these demonstrate major year-to-year fluctuations in beetle numbers and distributions – the prime influence appears to be summer flooding. These results highlight the vulnerability of the River Ouse (i.e. the British) population and emphasise the urgency of establishing populations at other locations unaffected by flooding.

Conservation footnote

We have presented information in this paper that enables the localisation of certain Tansy Beetle populations. We urge entomologists not to collect more than a single reference specimen from the wild.

Acknowledgements

Much of the early work on Tansy Beetle ecology was undertaken at the University of York with two grants from NERC, with CASE support from English Nature (EN) as part of its Species Recovery Plan. We thank Dr Roger Key (EN) for facilitating this support, Professor Calvin Dytham for co-supervising the Ph.D. projects and the City of York Council (CYC) for additional financial help. Roma Oxford pioneered the techniques for successful captive-breeding of the beetle. Conservation work over the last five years has been co-ordinated by the Tansy Beetle Action Group (TBAG) comprising Daniel Calvert (CYC), Simon Christian (Natural England), Des Cotton (National Trust), Martin Fuller (Environment Agency), Ian Hughes (Dudley Zoo and the British and Irish Association of Zoos and Aquariums), Claire Jackson (Yorkshire Wildlife Trust), Vicky Kindemba (Buglife), Helen Kirk (Carstairs Countryside Trust), Judith Layzell (West Leeds Countryside Park), Douglas Louis (Leeds City Council), Rachel Midgley (CYC), Bob Missin (CYC), Roma Oxford, Mark Pethullis (National Trust), Deirdre Rooney (Askham Bryan College), David Ward (West Leeds Countryside Park) and the authors. We are extremely grateful to all TBAG members for their ideas and actions and to the SITA Trust for funding practical aspects of our conservation work for the past three years. We would particularly like to thank all the volunteer surveyors whose careful work has enabled us to construct detailed annual maps of beetle distributions. Ben Scott and Martin Fuller (Environment Agency) kindly supplied the river-level data, Howard Mendel, Duncan Sivell and Stuart Warrington provided information about the beetle in the East Anglian Fens and Mike Denton clarified the beetle record from the Isles of Scilly.

References

[1] http://www.northyorks.gov.uk/CHttpHandler.ashx?id=21730&p=0.

[2] http://www.northyorks.gov.uk/CHttpHandler.ashx?id=22472&p=0

[3] http://www.northyorks.gov.uk/CHttpHandler.ashx?id=21727&p=0

Anon (2007) UK priority species pages – Version 2. JNCC, Peterborough. http://jncc.defra.gov.uk/_speciespages/2171.pdf

Calvert, D (1998) *Tansy Beetle Survey*. Unpub. report. York City Council.

Chapman, D. S. (2006) *Spatial Ecology of the Tansy Beetle (*Chrysolina graminis*)*. Unpub. Ph.D.thesis, University of York, York.

Chapman, D. S., Sivell, D., Oxford, G. S., Dytham, C. and Key, R. (2006) Ecology of the Tansy beetle (*Chrysolina graminis*) in Britain. *The Naturalist* 131: 41–54.

Chapman, D. S., Dytham, C. and Oxford, G. S. (2007) Modelling population redistribution in a leaf beetle: an evaluation of alternative dispersal functions. *Journal of Animal Ecology* 76:36-44.

Cox, M. L. (2007) *Atlas of the Seed and Leaf Beetles of Britain and Ireland*. Pisces Publications, Newbury.

Fowler, H. J. (2005) Are extremes increasing? Changing rainfall patterns in Yorkshire. *The Yorkshire and Humber Regional Review* 15: 29–31.

Hyman, P. S. (revised Parsons, M. S.) (1992) *A Review of the Scarce and Threatened Coleoptera of Great Britain Part I.* UK Nature Conservancy Report No. 3, JNCC, Peterborough.

Lane, S. N. (2003) More floods, less rain? Changing hydrology in a Yorkshire context. In: Atherden, M. (ed.) *Global Warming in a Yorkshire Context*. PLACE Research Centre, York. pp. 35–70.

Longfield, S. A. (1998) *River Response to Recent Environmental Change in the Yorkshire Ouse Basin, Northern England*. Unpub. Ph.D.thesis, University of Leeds, Leeds.

Macdonald, N. (2012) Trends in flood seasonality of the River Ouse (Northern England) from archive and instrumental sources since AD 1600. *Climate Change* 110: 901–923.

Macdonald, N. and Black, A. R. (2010) Reassessment of flood frequency using historical information for the River Ouse at York, UK (1200–2000). *Hydrological Sciences Journal* 55: 1152–1162.

Oxford, G., Sivell, D., Dytham, C. and Key, R. (2003) The jewel of York – ecology and conservation of the Tansy beetle. *British Wildlife* 14: 332–337.

Radley, J. and Simms, C. (1970) *Yorkshire Flooding – Some Effects on Man and Nature*. The Ebor Press, York.

Sivell, D. (2003) *The Ecology and Conservation of the Tansy Beetle,* Chrysolina graminis. Unpub. Ph.D. thesis, University of York, York.

Review: Scary but beautiful - portraits of insects

An exhibition by John Bowers, shown at the Headingley Enterprise and Arts Centre, Headingley, Leeds, from 1 April until 3 June, 2013.

A walk around these 34 portrayals of insects and other natural life, busying themselves in their multifarious activities, is a walk that captures them at moments and magnifications when their range of colour and bodily engineering is a continual surprise. The postures and situations in which the photographer has caught them are the rewards won by many hours of searching and waiting and, of course, loving commitment. The places at which the creatures are pictured vary from the magic isle of Lesbos to the more homely Primrose Park, but all are looked at with the same levels of wonder and, at times, astonishment.

Such an exhibition might, at first thought, be expected to appeal primarily to the entomologist or naturalist, but stay with it sometime longer and it is equally concerned with the pictorial space viewed as an abstract composition, based on line and curve, the individual inscapes of the creatures shown contributing some intriguingly detailed structures and patterns. Such a pioneer of aesthetic form in natural phenomena as D'Arcy Thompson would have loved it.

AH

Yorkshire Hedgehog bounty payments: a window on four centuries of status and distribution change

Colin A. Howes
colinhowes@blueyonder.co.uk

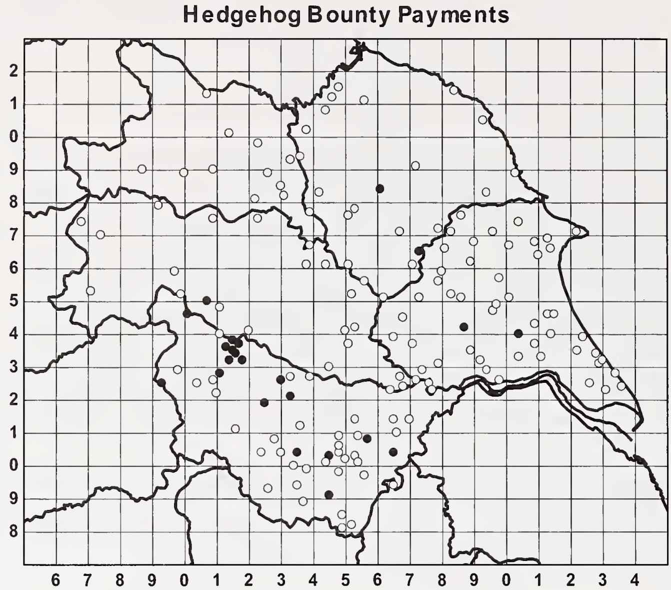
Tudor vermin bounty legislation

In 1532 Henry VIII passed an *Act made and ordained to destroy Choughs* (any member of the Corvidae). This law was substantially enlarged in 1566, in the reign of Elizabeth I, by the *Act for the Preservation of Grayne.* A rather misnamed legal instrument, it encouraged the slaughter of a wide range of predatory birds and mammals which would otherwise have controlled rodents and seed-eating birds that naturally fed on or spoiled grain. In addition to these predators, insectivorous mammals such as Hedgehog *Erinaceus europaeus*, Mole *Talpa europaea* and bats were included. The 1566 Act required parishes to levy a tax or rate to fund the payment of bounties for the heads of these prescribed "Vermin", though it was left to the discretion of vestry meetings which, if any, vermin to target. In that financial transactions were involved, detailed records of each bounty payment or seasonal accumulations of such payments were kept by the parish Churchwardens and latterly by such civic officers as Parish Constables and Overseers of the Poor.

Parish accounts, a valuable source of biological records

These documents, often on vellum and often in untutored hand, were traditionally stored in church parish chests. Today regulations require that they be brought together with Diocesan records located in Local Authority Archives or County Records Offices with some maintained in academic institutions such as the Borthwick Institute for Archives, York University. Though somewhat laborious to locate, decipher and extract, the particular value of these sources lies in their provenanced, dated, statistically based and often long-term nature. Though samples of vermin bounty payments from individual Yorkshire parishes were occasionally published as curiosities in the topographies and local histories so popular during the late 19th century, e.g. those for Wakefield (Banks, 1871), Worsbrough (Wilkinson, 1872) and Lofthouse (Roberts, 1882), more rigorous analyses were provided in the studies of the accounts from parishes within the Bradford Diocese (Wroot, 1895) and Kildwick (Booth, undated). Through the work of Howes (1980, 1984, 2002a and 2009) and Lovegrove (2007) churchwardens' and similar accounts of 163 Yorkshire parishes and townships have now been examined. Of these, 108 (66%) contained references to payments for vermin bounties but only 23 (21%) of this latter set contained evidence of payments made for killing Hedgehogs (See Figure 1). This could indicate that Hedgehogs were either genuinely restricted in distribution or that they were not universally deemed to be pests.

Figure 1: Map of the five Yorkshire vice counties showing the locations of the parishes examined for 16th to 19th century 'Vermin' bounty payments. Solid dots indicate parishes where bounties were paid for Hedgehogs.



Specific entries are too numerous to list here but are catalogued in Appendix 2.1-3 in Howes (2009) and Appendix 1 in Lovegrove (2007). A brief analysis is given here in Table 1.

Table 1: Frequency of Hedgehog bounties in Yorkshire parishes (calculated from Howes 2009 and Lovegrove 2007). Figures in square brackets [ ] indicate relative frequency on a scale of 1-5, very infrequent to very numerous (Lovegrove 2007).

Parish	**Date range of archive**	**Total Hedgehog bounties**	**Maximum Hedgehog bounties per year**	**Mean no. of Hedgehogs/year over 10+ year date-range**
Arksey with Bentley	1719-1773	6	6 in 1732	0.11
Addingham	1668-1825	[1]		
Beverley	1592-1736	7	7 in 1646	0.04
Bolton on Dearne	1738-1808	unspecified		
Bradford	1668-1748	121	24 in 1678	1.51
Bowling	1678-1680	6	3 in 1678	
Cramb	1736-1794	[1]		
Doncaster (Auckley)	1620	2		
East Ardsley	1811	10		
Eccleshill	1678	13		
Helmsley	1671 to 1782	[2]		
Horton	1680	3		
Kildwick	1660-1826	265	124 in 1673	1.59
Langfield	1771-1832	[3]		
Little Heaton	1678	2		

Parish	Date range of archive	Total Hedgehog bounties	Maximum Hedgehog bounties per year	Mean no. of Hedgehogs/year over 10+ year date-range
Manningham	1677-1680	4	4 in 1680	
Market Weighton	1681-1784	[2]		
Northowram	1677-1688	8	8 in 1688	0.72
Shipley	1676-1778	14	6 in 1676	0.13
Thornhill	1672-1823	59	59 in 1823	
Wakefield	1682-1683	37	35 in 1682	
Whiston	1683-1846	4	4 in 1688	
Worsbrough	1704-1825	62	38 in 1727	0.51

This study located records of Hedgehog bounty payments in 23 Yorkshire parishes and counted a total of 609 specimens. The pattern of bounty payments from 1620 to 1823 is shown in Figure 2.

The intermittent occurrence and levels of persecution are as yet unexplained, though it is not due to gaps in date runs in available archives (see table 1). The distinct group of bounties paid during the early 19th century may relate to the prejudice against Hedgehogs concurrent with the rise of shooting estates where Hedgehogs were deemed to predate the nests of game birds, or may be partly a reflection of raising the Hedgehog bounty tariff from 2d. per head, as set in the 1566 Act, to 4d. per head in the parishes of Kildwick from 1807 and East Ardsley from 1811.

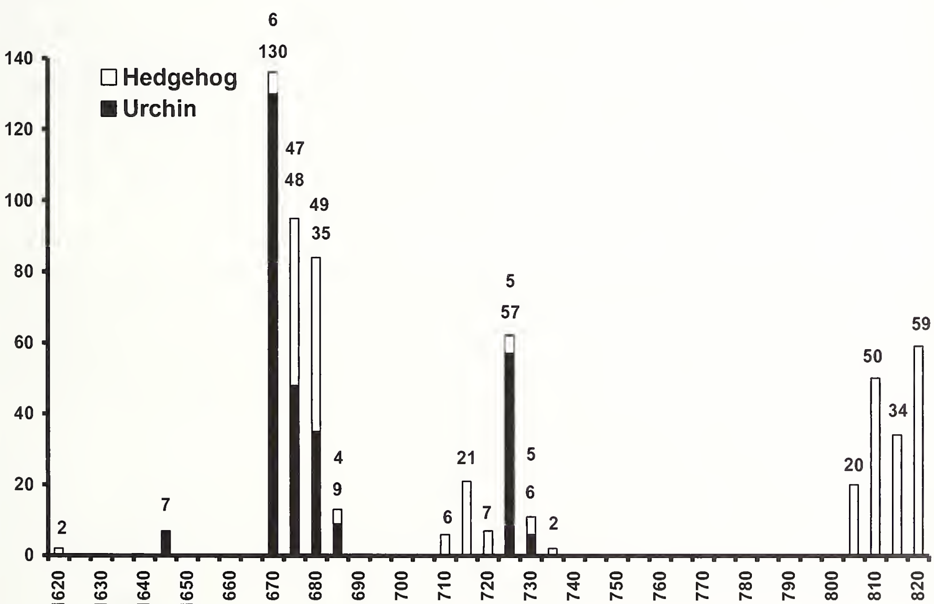


Figure 2: Cumulative numbers of Hedgehog bounties paid in Yorkshire parishes in five year periods 1620 to 1824 recorded under the names of Hedgehog or Urchin.

The highest annual figures were 24 in Bradford in 1678; 35 in Wakefield in 1682; 38 in Worsbrough in 1727; 59 in Thornhill in 1823 and 124 in Kildwick in 1673. The highest cumulative numbers of Hedgehog bounties per 10+ year data runs were 62 (mean of 0.51 per year) from Worsbrough, 121 (mean 1.51/year) from Bradford and 265 (mean of 1.59/year) from Kildwick. These are significantly fewer than in adjacent counties to the south, for instance in the parish of Worksworth in Derbyshire with a total of 3,164 Hedgehog bounties giving a mean of 46.52/year or in Rosthern in adjacent Cheshire with a total of 4,064 Hedgehog bounties giving a mean of 51.44/year.

Discussion

Distribution: Figure 1 effectively provides the earliest distribution map of the Hedgehog in Yorkshire, with dates ranging from 1620 to 1824. This therefore pre-dates records generated by late 19th and 20th century scientific and natural history societies. Although the distributional range extends from Langfield (Todmorden, SD9324) and Kildwick (SE0145) in the west to Market Weighton (SE8741) and Beverley (TA0439) in the east, and from Whiston (SK4590) in the south to Helmsley (SE6183) in the north, there was a marked concentration in upland south and west Yorkshire and a marked absence from parishes in the central Vales of Mowbray, York and the Humberhead Levels, the Humber Estuary, Holderness plain and the Vale of Pickering. In the north, there was a total absence from parishes in the northern parts of Mid-west Yorkshire (VC64), all of North-west Yorkshire (VC65) and the northern and eastern extremities of North-east Yorkshire (VC62), including the Tees lowlands. This is in marked contrast to the 20th century distribution shown in (Howes 1983) updated in Delany (1985) and in the 1996-2006 re-mapping of terrestrial mammals in North Yorkshire (Oxford *et al.*, 2007). Further, the YNU Hedgehog road casualty frequency monitoring survey of 1990-91 (Howes 2002b) showed a contrary pattern with higher densities in the Dales fringes of VCs 64 and 65 (9.72 Hedgehog casualties per 100 miles), Vales of Pickering (10.11/100miles), York and Mowbray (10.80/100miles) and Holderness (11.68/100miles) compared with the conurbations of South and West Yorkshire (5.55/100miles) and the Southern Magnesian limestone (2.15/100miles).

Since the majority of records pre-date many of Yorkshire's major wetland drainage schemes and the plethora of those associated with the Parliamentary Enclosure Acts of the mid-18th to mid-19th century, Figure 1 may indicate a specific avoidance of Yorkshire's lowland and river valley geography. Landscapes dominated by wetlands subject to additional seasonal flooding would have been inimical to a terrestrial hibernator.

Lovegrove's (*loc. cit.*) study of churchwardens' accounts from English and Welsh counties revealed an intriguing distributional trend, showing the counties with most Hedgehog bounties occurred south of a line from the Mersey to the Humber, greatest frequencies being in the south-western counties. Counties north of this line, including Yorkshire, had many fewer as demonstrated by the contrasting Derbyshire and Cheshire examples mentioned above, while the northern English counties of Cumberland, Durham and Northumberland had no records of Hedgehog bounties at all. This latter feature is reversed

in the current distribution map in Bond (2012), which demonstrates a wide and dense distribution.

Vernacular names

Vernacular terms used in bounty records are of two basic forms, Urchin and Hedgehog. The Urchin form occurred 292 (48%) times and tended to be of earlier usage, from 1642 to 1732 (see Figure 2). Spelling variations included Ourchant, Urchant, Uerchan [the plural form ending in s or es], Urchin and Urchon. Interestingly, according to the Oxford English Dictionary the earliest usage of the term Urchin, thought to derive from the medieval French (Morris, 1983), was by Richard Rolle, the religious mystic of Hampole near Doncaster, in his *Hampole Psalter* written about 1340.

The currently familiar Hedgehog form occurred 317 (52%) times in the churchwardens' accounts from 1620 through to 1823. The relative frequency of its usage increased from the late 17th century; it became the exclusively used form by the 19th century (see Figure 2). The spelling and format variations in the first syllable included Hedge, Hedg, Heg, Hegg, Heig and Hej. The second syllable which included hodg, hog and hogg, could be linked as one word or separated by a space or a hyphen. There was no discernible difference in the geographical distribution of the two basic name forms, the list of parishes in which the two forms occurred being almost identical.

Acknowledgements

This project was assembled for presentation to the YNU History Section meeting at The Yorkshire Museum on 29 May 2013. It is a by-product of research undertaken while registered as an external student at Bradford University (see bibliography) and I must thank Professor Mark Seaward for considerable encouragement over many years. Thanks are due to Jill Lucas for permission to use her illustrations. I am most grateful to Albert Henderson for the interpretation of the Richard Rolle text.

References

Banks, W.S. (1871) *Walks in Yorkshire: Wakefield and Its Neighbourhood*. B.W. Allen, Wakefield.

Bond, I. (2012) (ed.) Mammals, Reptiles and Amphibians of the North East. *Northern Naturalist* 73: 1-246.

Booth, H.B. (Undated) Notes from the Kildwick churchwardens' account book 1669-1849. [Unpublished MS. in Cliffe Castle Museum, Keighley.]

Bramley, H.R. (1884) *The Psalter or Psalms of David and Certain Canticles*. Clarendon Press, Oxford.

Delany, M.J. (1985) (ed.) *Yorkshire Mammals*. University of Bradford, Bradford.

Howes, C.A. (1980) Aspects of the history and distribution of Polecats and Ferrets in Yorkshire and adjacent areas. *The Naturalist* 105: 3-16.

Howes, C.A. (1983) An Atlas of Yorkshire mammals. *The Naturalist* 108: 42-82.

Howes, C.A. (1984) *Changes in the status of some Yorkshire mammals, 1600-1980.* Unpublished M.Phil. thesis, University of Bradford.

Howes, C.A. (2002a) Barn Owls (*Tyto alba*) in Churchwardens' Accounts of the 17th and 18th centuries: An indication of past abundance in East Yorkshire. *The Naturalist* 127: 133-137.

Howes, C.A. (2002b) The Yorkshire Flat Hedgehog Survey. (*Conference 2000 Proceedings: Recording and Monitoring Yorkshire's Natural Environment) YNU Bulletin* (*Suppl.*):76-78.
Howes, C.A. (2009) *Changes in the status and distribution of mammals of the Order Carnivora in Yorkshire from 1600*. Unpublished Ph.D. thesis, University of Bradford.
Lovegrove, R. (2007) *Silent Spring*. Oxford University Press, Oxford.
Lucas, J. (2013) *All things Wild and Wonderful*. Northern Bee Books. Huddersfield.
Morris, P. (1983) *Hedgehogs*. Whittet Books, Weybridge.
Oxford, G., Mortimer, J., Hanson, A., Pickles, S., and Thompson, M. (2007) Preliminary mapping of terrestrial mammal distributions in North Yorkshire 1996-2006. *The Naturalist* 123: 73-99.
Roberts, G. (1882) *The Topography and Natural History of Lofthouse and its Neighbourhood*. D. Bogue, London.
Wilkinson, J. (1872) *The History of Worsborough*. Farrington, London.
Wroot, H.E. (1895) Natural history notes from the Bradford churchwardens' accounts. *The Naturalist* 20: 305-306.

Urchins on the doorstep: revelations of a Hedgehog 'Mark and Release' project

Colin A. Howes

Introduction

Following the methods outlined by Morris (1983) a Hedgehog *Erinaceus europaeus* mark and release project was undertaken during 1992 and continued to a lesser extent in 1993 and 94 in a small suburban back garden in Doncaster, South Yorkshire. The aim was to investigate the population of Hedgehogs visiting a recently constructed housing development, to look for any patterns of occurrence or behaviour, monitor seasonal weight changes and generally to enjoy observing Hedgehogs from one's own back doorstep.

Study area: The project was undertaken on the Arden Gate housing estate (SK557998), a 1979/82 'green field' development of approximately 200 mainly detached houses and bungalows on the outskirts of Balby, Doncaster. The estate is situated between the embankment of the A1(M), a 'B' road (Broomhouse Lane), a 'C' road (Springwell Lane) and a disused, now wooded, railway embankment. Adjacent land use includes an area of municipal allotments and company sports grounds. The 4.5m x 10m rear garden is primarily a rectangular lawn on heavy clay soil, thinly edged by shrubs of Japanese Quince *Chaenomeles japonica,* Wall Cotoneaster *Cotoneaster horizontalis*, Holly *Ilex aquifolium, Hydrangea macrophylla,* Honeysuckle *Lonicera periclymenum* var., *Kerria japonica,* Rose-of-Sharon *Hypericum calycinum*, Tamarisk *Tamarix pentandra* and Greater Periwinkle *Vinca major* with various ornamental conifers including *Chamaecyparis, Juniperus* and *Thuja* spp.

Adjacent to the garden is a prefabricated concrete garage covered by Ivy *Hedera helix*, to the rear of which is a compost bin and a 2m x 3m plot on which was grown Potatoes *Solanum tuberosum*, Runner Beans *Phaseolus coccineus* and a crown of Rhubarb *Rheum rhabarbarum*. Adjacent to the garage is a small 1m x 2m pond surrounded by Elephant-eared Saxifrage *Bergenia cordifolia*.

Equipment and methods: Equipment consisted of a torch with a 4inch wide beam, powered by four 1.5V batteries, a pair of sturdy gardening gloves, a set of 'Salter' kitchen scales, a tin of 'Crown' white undercoat paint and a 2 inch wide paint brush. To act as a focus for Hedgehog activity, saucers of water, bread and milk, and dog or cat food were placed in the centre of the lawn.

Observations, through a clear glass door during bad weather or an open door in fine weather, were generally made during a four hour period from 10.30pm to 2.30am. Markings, usually a conspicuous 5cm diameter white dot, followed the pattern and sequence outlined in Morris (1983).

Results

Observations were kept on 94 occasions in 1992, fourteen occasions in 1993 and two occasions in 1994. Altogether 24 Hedgehogs were marked: five females, five males and fourteen of unknown sex.

Fifteen Hedgehogs were marked in 1992 and the 94 occurrences were recorded during 63 nights from 21 May to 17 November with up to five Hedgehogs present at any one time. Five Hedgehogs were marked in 1993 and they were recorded during eleven nights from 4 April to 25 July and four Hedgehogs were marked in 1994 when there were just four recorded occurrences on 20 to 21 July.

Population monitoring: The pattern of recruitment into the marked population in 1992 is given in Figure 1, which shows that encounters with nine (60%) of the visiting Hedgehogs took place within 26 nights. Subsequent 'new' animals turned up at intervals of 59, 32, 18, 1, 18 and 23 nights. The last, occurring on 17 November and weighing only 252g, was a recently born and possibly a second litter animal. The initial rush of recruits may be an indication of the size of the core foraging population. Morris (1983) reported at least eleven Hedgehogs visiting the feeding bowl in his study site in just seventeen nights.

The fifteen specimens did not represent the entire local population in 1992 since two unmarked Hedgehogs were road casualties within 100m of the study site.

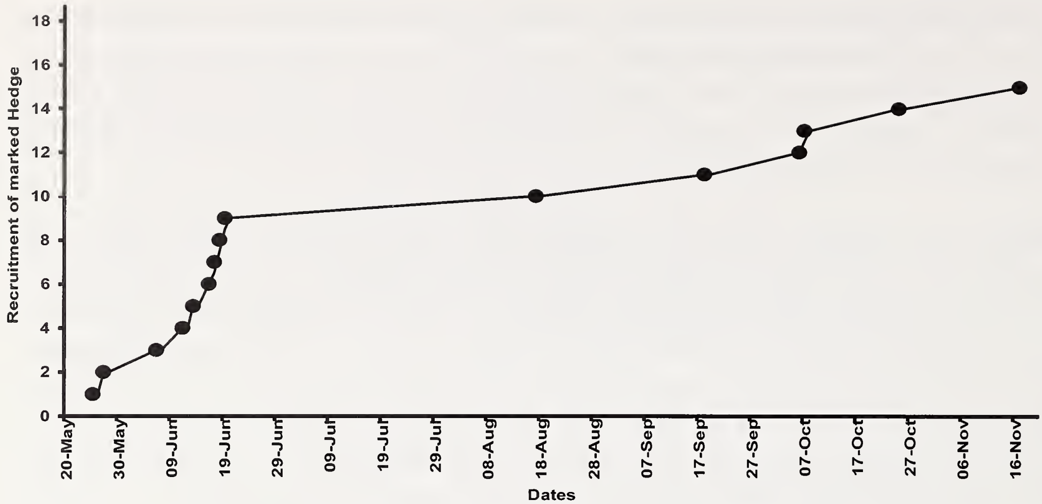


Figure 1. Pattern of recruitment of fifteen marked Hedgehogs entering the study site 26 May to 17 November 1992.

How often individual Hedgehogs visited the study site is shown in Table 1. Visits ranged from one to 25 (mean return visit frequency = 6.2 nights per Hedgehog).

Table 1: Frequencies with which marked Hedgehogs were recorded at the study site.

Number of marked Hedgehogs	10	4	2	2	1	1	1	1	1	1	1
Number of nights present	1	2	3	4	5	6	8	9	13	14	25

Ten (66%) of the colour-marked specimens were only recorded on one occasion, presumably indicating that the study site was peripheral to their foraging ranges. For the remaining specimens the study site was presumably closer to the core of their foraging ranges and, in the case of the female which returned on twenty five occasions, it may have been close to her natal nest site. An indication of the size of the local Hedgehog foraging range was a report of one of the colour-marked specimens observed in a garden 600m (straight line) away on an adjacent housing estate (Andrea Marshall *pers. comm.*). Morris (1983) noted that his radio tracking studies on a golf course and adjacent gardens where food was plentiful showed that Hedgehogs travelled 2-3 km per night, though extensive radio tracking by his student Nigel Reeve (1994) revealing the sizes and shapes of larger male and smaller female home range polygons, suggests that this distance indicated a male.

Since Hedgehogs were generally observed on each monitoring night, Figure 2 is essentially a record of monitoring activity, though the patterns of multiple occurrences may represent periods of increased foraging activity. Occurrences in April possibly related to heightened feeding activity to replenish body weight post-hibernation. The late May to late July activity peak, with up to five present at the feeding bowls in a single evening, may represent heightened courtship activity and enhanced food foraging by lactating females. The October peak coincides with increased weight deposition and presumably, therefore,

enhanced foraging activity prior to autumn hibernation (see also Tables 3 & 4 and Figure 5). No adult Hedgehogs visited after October.

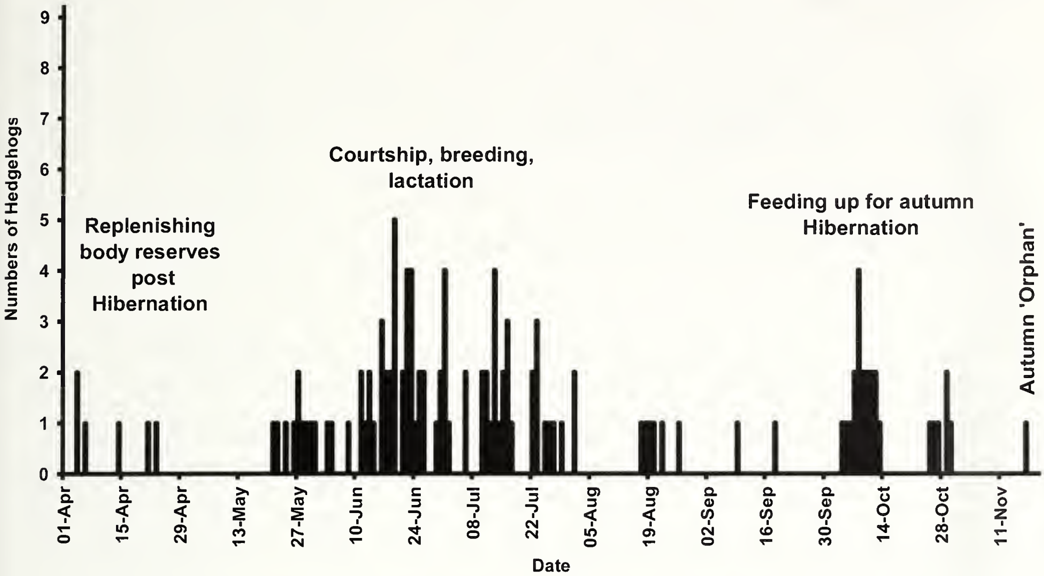


Figure 2. The numbers of Hedgehogs recorded on single nights. (1992-1994 combined).

Occurrence times: As Hedgehog daytime nests were never found within the study site, it is assumed that the timing of Hedgehog visits to the garden did not refer to emergence times but to perambulating specimens being active within their foraging ranges. The earliest nightly times that individual Hedgehogs appeared in the study site are shown in Figure 3. From 24 May to 18 September 41 appearance times ranged from 83 to 328 minutes after sunset (mean 206 minutes) and from 4 to 27 October, the thirteen monitored appearance times ranged from 277 to 601 minutes after sunset (mean 380 minutes).

No significant differences in my monitoring patterns could explain this step change and all times were recorded during the period of British Summer Time. However, the later mean appearance times through October coincided with the phase when Hedgehogs were rapidly increasing their body weights. This could suggest that Hedgehogs were concentrating on more productive feeding areas elsewhere within their home ranges and were arriving in the garden later. Reeve (1994) notes that later in the season Hedgehogs remain active later in the darker mornings, possibly taking advantage of extra foraging time to improve body condition before hibernating.

Weights: During the project 44 weight measurements were taken from twenty animals, the ranges and means for males, females and animals of unknown sexes are given in Table 2 and the overall weight range and pattern of 50g weight categories are shown in Figure 4.

Figure 3. Occurrence times, midnight and sunset times plotted in minutes within 48hrs.

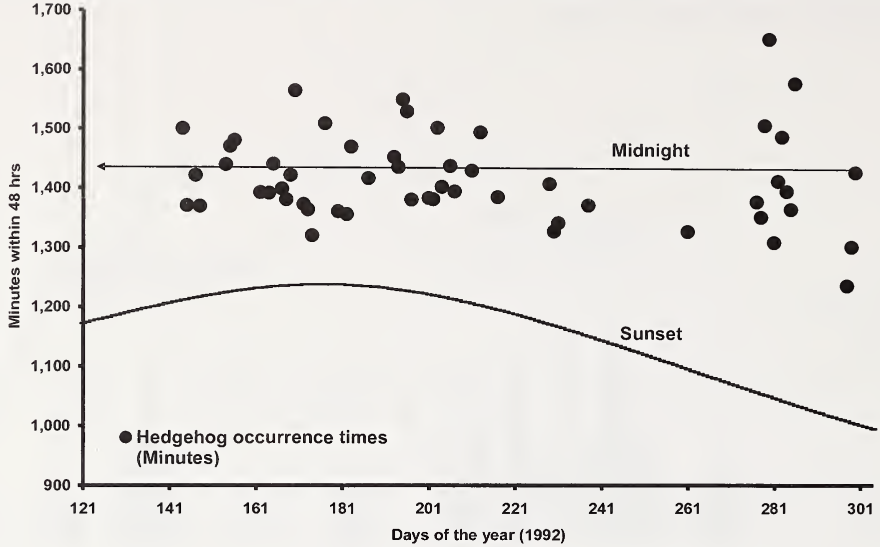


Table 2. Hedgehog weight (g.) ranges and means

	Range	Number	Mean
Female	595 to 1,247	16	1,014
Male	794 to 1,077	6	958
Unknown	255 to 1,247	22	862
Total	595 to 1,247	44	983

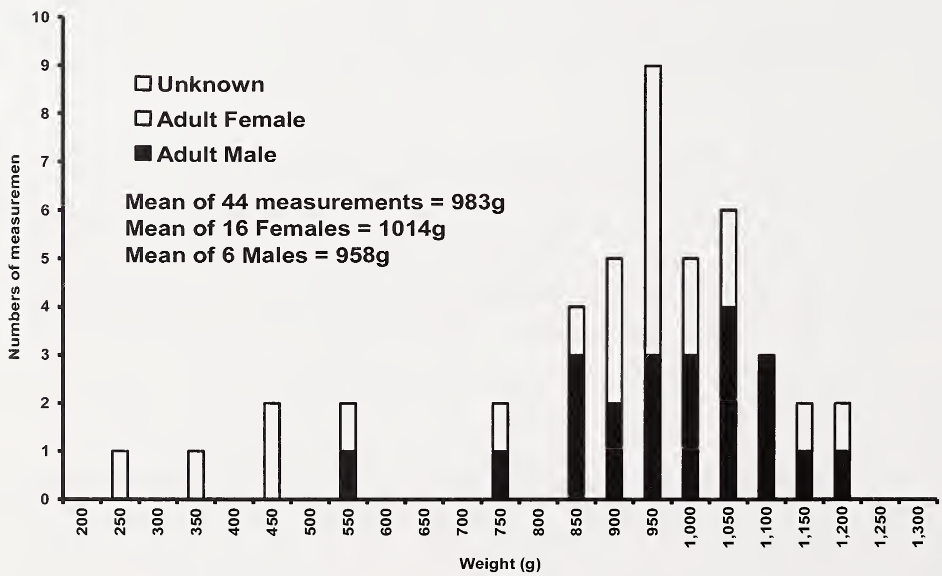


Figure 4. Weight range of all measurements taken from males, females and specimens of unknown sexes (1992-1994 data combined).

Pregnancy, birth/lactation & weight loss: Three specimens showed weight fluctuation from June to August which was likely to be due to parturition and/or lactation (see Figure 5). A female, heavily pregnant and with distended nipples, and weighing 1049g on 1 July lost 425g (40.5% of her peak weight), reaching the low weight of 624g by 25 July. A female weighing 850g on 21 April, increased to 935g on 8 June and 992g by 29 June. She then lost 397g (60% of her peak weight), reaching the low weight of 595g by 25 July. A specimen of unknown sex weighing 851g lost 57g (6.7% of its weight) from 23 July to 1 August.

Pre-hibernation weight gain: Figure 5 shows that weights remained relatively unchanged during the midsummer period but a rapid increment was demonstrated by six specimens in October prior to hibernation.

Table 3. Pre-hibernation body weight (g.) increment in six Hedgehogs.

Sex	Date	Min. weight g.	Date	Max weight g.	Increment	Mean increase per night
Female	27 July	964	27 Oct.	1,134	170	1.2
Female	04 Oct	1,134	08 Oct.	1,247	113	28.3
Male	07 Oct.	1020	09 Oct	1,077	57	19.0
?	05 Oct.	907	11 Oct.	992	85	14.2
?	18 Sept.	964	08 Oct.	1,247	283	13.5
?	06 Oct.	964	29 Oct.	1,162	198	8.6

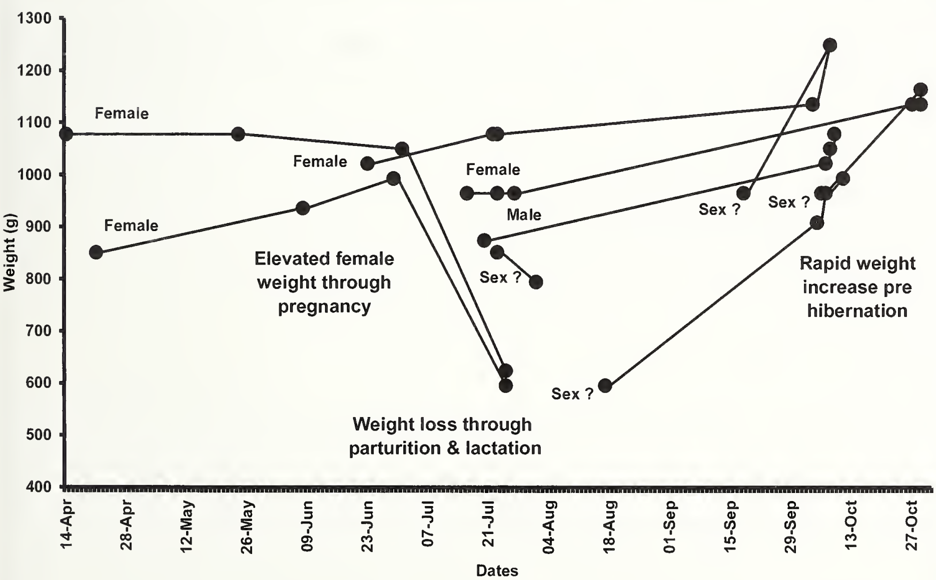


Figure 5. Seasonal weight fluctuations in nine colour-marked Hedgehogs

Table 4 shows that the mean weight of 927g (n = 16) in July rose to 1,079g (n = 13) in October. Three specimens weighing 1lb (453g) or less were deemed to be young of the year and not included in Table 4. Their weights were 454g (22 Aug), 453g (9 Sept) and 255g (17

Nov), the last being taken into captivity for overwinter feeding since its weight would not have allowed successful hibernation.

Table 4. Mean weights (g.) of Hedgehogs above 453g April to October 1992

Month	Range	Number	Mean
April	805 to 1,077	3	1,001
May	1,077	1	
June	907 to 1,020	3	954
July	595 to 1,190	16	927
August	794 to 595	2	695
September	963	1	
October	907 to 1,247	13	1,079

Conclusions

Though revealing a number of aspects of activity patterns and cycles of weight loss and acquisition not previously examined in Yorkshire, this preliminary study could not in itself generate sufficient data to do more than hint at these trends and patterns in the life cycle, behaviour and ecology of this familiar though little studied mammal. In order to make progress I would encourage naturalists to attempt similar mark and release projects with Hedgehogs, though this may nowadays be enhanced with such devices as camera traps and radio tracking.

Acknowledgements

Thanks are due to Andrea Marshall for reporting one of the colour-marked Hedgehogs in her garden. Acknowledgement is due to my long-suffering neighbours.

References

Morris, P. (1983) *Hedgehogs*. Whittet Books, Weybridge, Surrey.
Reeve, N. (1994) *Hedgehogs*. T & AD Poyser Ltd, London.

Hedgehog diet during the extreme drought of summer 1976

Colin A. Howes

Introduction

In the context of UK weather patterns which seem increasingly prone to extremes of meteorological events (floods, droughts, heat waves, cold spells, storms, etc.), the responses of our fauna to these events is currently of interest, leading to speculation of

local extinctions and changes in biodiversity status. The ability of the Hedgehog *Erinaceus europaeus* to cope with the extreme drought of 1975-76 was fortuitously made possible by the analysis of a series of 22 Hedgehog droppings collected from 12 July to 3 October 1976 in a garden off Anchorage Lane, Sprotbrough, Doncaster (SE/5603).

A number of diet studies have been undertaken in Britain and abroad against which this evidently atypical sample can be compared. Dimelow (1963) undertook food preference tests under laboratory conditions. Of free living populations, Kruuk (1964) examined 33 droppings collected March-June 1963 from the Black-headed gull *Chroicocephalus ridibundus* colony at Ravenglass sand dunes, Cumbria, Yalden (1976) examined the contents of 137 stomachs from Hedgehogs killed on various East Anglian shooting estates 1966-1969, Wroot (1984) examined 39 droppings collected July-November 1981 and April-July 1982 from a suburban golf course and adjacent gardens in Ashford, Middlesex, and Dickman (1988) examined 87 stomachs/guts from rural and suburban localities in Oxfordshire from November 1982 to July 1984. Grosshans (1983) examined 125 Hedgehog stomachs from rural and suburban sites in Schleswig-Holstein, Germany in 1975-1976; in New Zealand, Brockie (1959) examined the contents of 5 stomachs and 90 droppings of feral European Hedgehog from rural and suburban sites; in 1970-1971 Campbell (1973) examined 230 droppings from pastureland near Canterbury, South Island.

Study site

The rear garden was bounded by a tall, thick hedge of Garden Privet *Ligustrum ovalifolium* and a line of Lombardy Poplars *Populus nigra* var *italica*. It contained an Apple *Malus domestica* and Pear *Pyrus communis* orchard, a soft fruit area growing Goosberries *Ribes uva-crispa*, Red and Black Currants *Ribes rubrum* and *R. nigrum* and Raspberries *Rubus idaeus*. The garden also included a greenhouse in which were grown Tomatoes *Solanum lycopersicum*, a rockery with a small central ornamental pond, an open compost heap, two lawned areas and a raised garden shed under which Hedgehogs could take refuge. The garden directly abutted onto four other rear gardens which formed part of an extensive acreage of mature gardens of inter-war residential properties. This study is a continuation of a field note on suburban Hedgehogs (Howes, 1976).

Meteorological context

May 1975 to April 1976 was the driest 12 month period for England and Wales since records began in 1727. Murray (1977) showed that from May 1975 to August 1976 only 60% of mean rainfall (mean for 1916-1950) was recorded, a deficit situation exacerbated by an increased mean temperature of 3°C above the 1941-1970 average. In 1976 the temperature in Doncaster was above 27°C (80°F) for 33 days from June to the end of August, reaching 32°C (89.6°F) on 27 June, 2 and 3 July. Further, rainfall during June to August 1976 was only about 20% for the summer mean (1916-50). The soil moisture situation was of critical importance to the terrestrial and soil invertebrates on which Hedgehogs depend for much of their food weight. On 21 April 1976 there was already an estimated soil moisture deficit of 25mm and by 25 August parts of Doncaster were amongst

the areas of the UK (along with parts of Cambridgeshire and Kent) with an estimated extreme soil moisture deficit as low as 138mm. June/July/August of 1976 was easily the driest, sunniest and warmest summer in the 20th century and probably the hottest summer for over three centuries. Despite the considerable soil moisture deficit reached by late August, the exceptionally wet September brought the official drought to an end and record high precipitation brought the soil moisture to capacity before the end of October. Precipitation over this period was the tenth highest since records began in 1727.

Methods

Hedgehog droppings were collected from the study site on 20 dates from 12 July to 3 October 1976. The drought was declared over by 10 September (Murray, 1977) and fortuitously diets (11 droppings each) were monitored on 10 dates either side of this threshold.

Droppings were examined separately under a binocular microscope. Where possible the numbers of identifiable prey items were estimated, eg. by counting the heads of ants, woodlouse telsons, pairs of earwig anal cerci and centipede poisonous claws. In addition to pairs of caterpillar mandibles, it was not unusual for the rather 'leathery' body sacks of larger Noctuidae caterpillars to partially survive digestion. All beetles and bees were identified by my colleague Dr Peter Skidmore by comparing fragments of leg and elytra with entire specimens in the Doncaster Museum entomological collection. Soft-bodied organisms were probably underestimated, though on five occasions the subcutaneous vestigial shells of slugs were identified. Earthworms were indicated by the presence of the fine gritty element of soil from their gut in which were amber-coloured locomotory chetae. Earthworm frequency was recorded in terms of numbers of chetae per dropping.

Daily precipitation and temperature records for the project period were obtained from the weather station at nearby RAF Finningley (Coordinates 53°48'N 1°0'0"W).

Results

Table 1 lists the food items identified and gives the number of droppings containing these items. It also gives the estimate of numbers of each item and its percentage frequency. Evidence of earthworms was identified in most of the droppings although it was not possible to estimate the number of individuals eaten. They were excluded from these totals and therefore from the percentage frequencies of prey items.

Droppings (numbers in brackets) also contained a range of evidently non-food items including moss (4), grass (4), feathers (3), Apple leaf (2), Tomato seeds (2), privet leaf (1), carpet tuft (1), wood (1), coal (1) and pebble (1). All but the privet leaf were taken during the drought phase and were assumed to have been taken while foraging *in extremis* for depleted sources of terrestrial invertebrates. 344 quantifiable prey items (arthropods and slugs) were identified together with an unknown though minimal volume of earthworms.

246 prey items were identified in the drought diets and 98 after the drought was deemed to have ended on 10 September.

Table 1: Prey items identified in 22 Hedgehog droppings 12 July to 3 October 1976

Prey taxa	No. of droppings with	% Droppings	Minimum No. of Prey items	% Prey items
Oligochaeta				
earthworms (inc. *Lumbricus terrestris)*	16	72%	94 (chetae)	
Isopoda (Woodlice)	**8**	**36%**	**20**	**6%**
Common Shiny Woodlice *Oniscus ascellus*	4		8	
Common Rough Woodlouse *Procellio scaber*	4		12	
Diplopoda (Millipedes)				
Tachypodoiulus niger	**1**	**5%**	**1**	**<1%**
Chilopoda (Centipedes)				
Lithobius forficatus	**6**	**27%**	**6**	**2%**
Coleoptera (Beetles)	**20**	**91%**	**23**	**7%**
Carabidae indet.	11		11	
Amara familiaris	1		1	
Black Clock *Pterostichus madidus*	1		1	
Pterostichus melanarius	1		1	
Pterostichus indet.	4		4	
Devil's Coach-horse *Ocypus olens*	1		1	
7-spot Ladybird *Coccinella 7-punctata*	1		1	
14-spot Ladybird *Progylea 14-punctata*	1		1	
Stephostethus lardarius	1		1	
Curculionidae indet	1		1	
Dermaptera (Earwigs)				
Common Earwig *Forficula auricularia*	**17**	**77%**	**140**	**41%**
Lepidoptera (Moths)				
Lepidoptera larvae	**14**	**64%**	**25**	**7%**
Hymenoptera (Bees & Ants)	**8**	**36%**	**118**	**34%**
bumble bee (indet.)	4		4	
Small Black Garden Ant *Lasius niger*	4		114	
Araneae (Spiders)	**2**	**9%**	**2**	**1%**
Opiliones (Harvestmen)	**4**	**18%**	**4**	**1%**
Paroligolophus agrestis	1		1	
Opilionidae (indet.)	3		3	
Gastropoda (Slugs)	**2**	**9%**	**5**	**1.5%**
Total invertebrate prey excluding earthworms	**22**	**100%**	**344**	

Prey weight: Yalden (1976) computed prey weight by weighing examples of prey types (excluding earthworms) taken from either the diet samples or from separately collected specimens. These weights were multiplied by the estimated numbers of that prey type and

expressed as a proportion of the total for all prey. In this study Yalden's prey conversion weights have been used, the results displayed as the pie diagram in Figure 1.

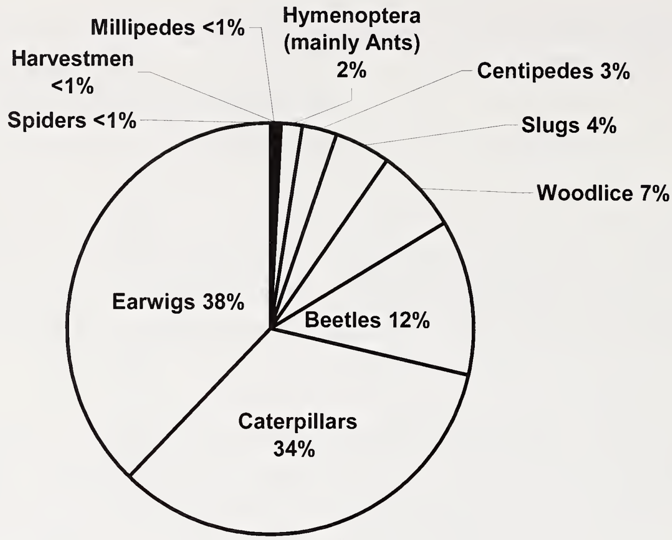


Figure 1: Relative importance of prey categories by weight (excluding earthworms) during the drought summer of 1976.

To illustrate differences in prey taken during and immediately after the drought, Figure 2 shows the numbers or quantities of food items identified in the droppings collected during the ten dates pre- and post-10 September.

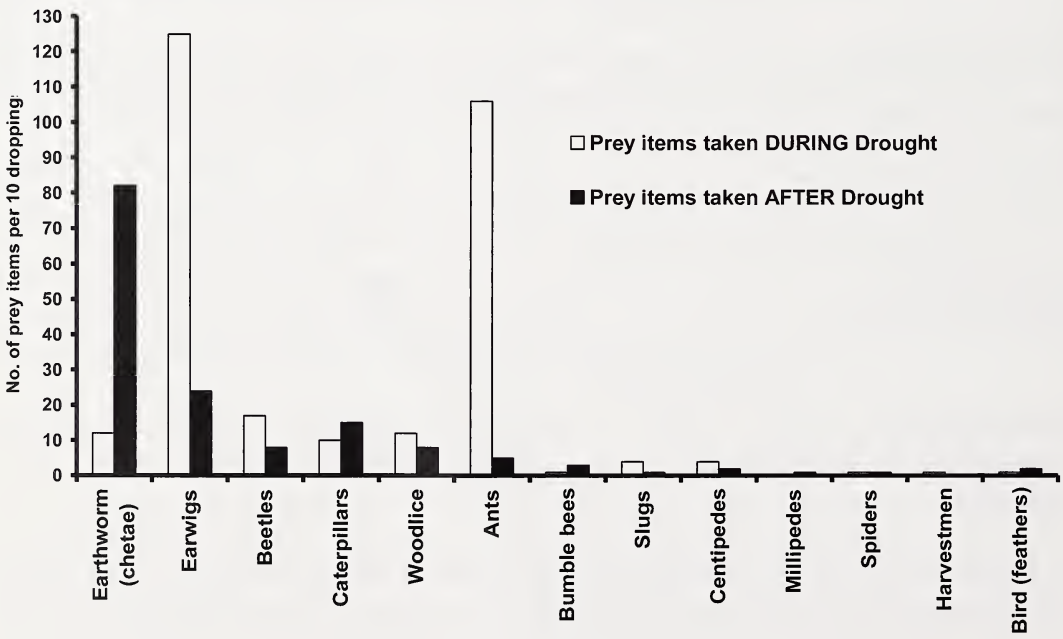


Figure 2: Frequencies of prey types pre- and post-10 September.

Earthworms: Earthworm chetae and accompanying particles of sand were found in 16 (72%) droppings, though the numbers of chetae totalled only 94 for the entire project and ranged from a mere 1 to 12 per dropping. This was a strong indication of the effect of drought and the profound soil moisture deficit which was keeping moisture-dependent soft-bodied invertebrates inactive and well below ground level. Figure 3 shows that the presence of earthworms and the numbers of chetae in each dropping. During the drought the mean number of chetae per dropping was of 1 rising to 8.2 per dropping after the first substantial rain on 11 September. However, even this elevated number was miniscule compared with an estimate of up to 45,000 chetae per dropping (!) encountered by Wroot (1984), who estimated that earthworms contributed about 34% of the total energy intake in his study. Yalden (1976) also considered earthworms to be the most important prey category, providing an estimated 13% of the diet by weight.

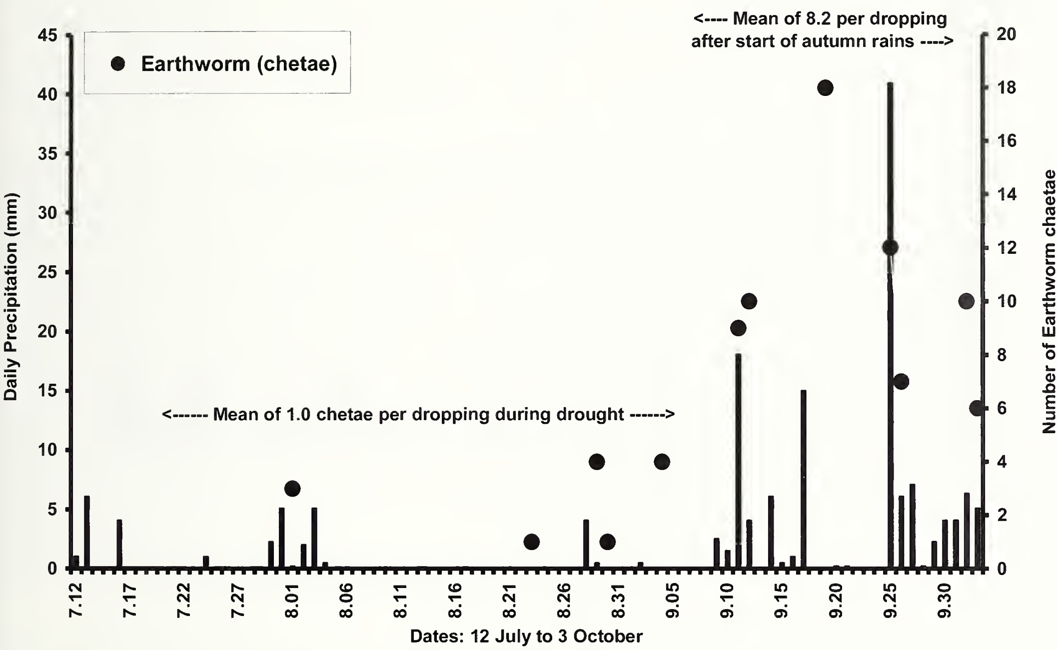


Figure 3: Changing frequencies of earthworms in diets as indicated by numbers of chetae.

Lepidopteran larvae: Caterpillars including larger Noctuidae, possibly Large Yellow Underwing *Noctua pronuba*, were present in 14 (64%) droppings and a minimum of 25 specimens represented 7% of prey items. Mean numbers ranged from a mere 1.0 per dropping during the drought and 1.5 after the first substantial rains on 11 September. In British, German and New Zealand studies lepidopteran larvae have been found to be preferred prey. Wroot (1984) reported up to 56 per dropping and Yalden (1976) reported up to 63 individuals in a single stomach. However, despite their low numbers in this study they still proportionally represented an estimated 34% of prey weight.

Earwigs: Common Earwigs are a frequent Hedgehog prey item in Britain, Yalden (1976) identifying them from 58% of stomachs, and Wroot (1984) counted 80 in 39 droppings (mean of 2.05). Based on counting pairs of the characteristic pincer-like anal cerci, this project found evidence of 149 individuals, giving an overall mean of 6.8 per dropping. Occurrences increased to a maximum of 35 per dropping as the drought progressed with a dry period mean of 12.5 per dropping, falling to a mean of 2.4 per dropping after the commencement of the rains (see Figure 4). These unusually high levels of occurrence resulted in an estimated prey weight of 38%, the highest diet component in this study.

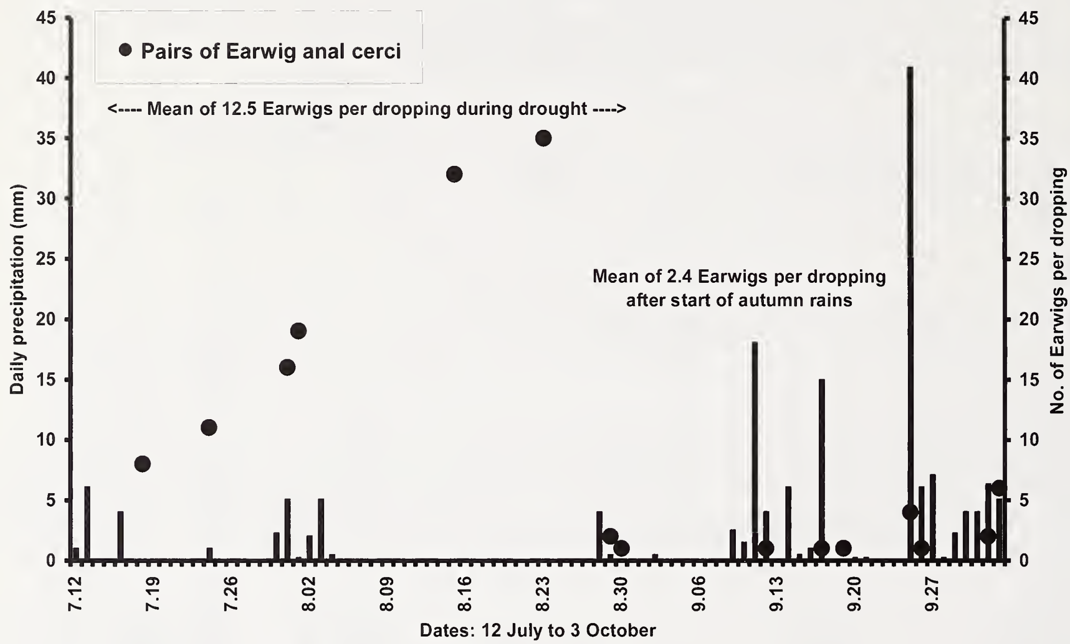


Figure 4: Changing frequencies of Common Earwigs (Dermaptera) in droppings as indicated by pairs of anal cerci.

Beetles: These occurred in 20 (91%) droppings. The remains of 23 beetles were counted; these belonged to the five families Carabidae (19), Lathridiidae (1), Curculionidae (1), Coccinellidae (2) and Staphilinidae (1) (See Table 2). The mean occurrence per dropping was 1.7 during the drought and 0.8 after the commencement of the rains. Over all, beetles in this study contributed 7% of prey items and 12% of prey weight. By comparison, those in Yalden's (1976) study contributed 27.2% of prey weight. The presence of a large Devil's Coach-horse was unusual since staphylinids (rove beetles) seem to be avoided (Yalden, 1976) or are only occasionally eaten (Wroot, 1984). The presence of two ladybirds (Coccinellidae) was unusual since these are normally avoided due to their protective chemistry. Dimelow (1963) reported that ladybirds were always rejected in food preference tests, noting that Rothschild (1961) found that these emit an orange liquid with a gassy, pungent, acrid, quinoline-like odour which is probably distasteful, even poisonous.

Hymenoptera: With the garden being situated on a very light sandy soil, conditions were suitable for the Small Black Garden Ant *Lasius niger,* numerous colonies of which were established along the concrete garden paths and around the bungalow foundations. One large colony developed an entrance into the dining room where attempts were made to control them. Disturbing the entrance portal with a stiff-bristled hand brush caused large numbers of ants to emerge to defend the colony. These were vigorously swept into a dust pan and decanted to a location in the garden. After a series of such attacks through an evening, the colony was temporarily depleted of worker ants.

Subsequent to these actions, ant remains were recovered from four Hedgehog droppings. The presence of a woollen carpet tuft which matched the dining room carpet and a long blond hair evidently from my landlady indicated that these ants were refugees from the dining room colony and were therefore being opportunistically preyed on by at least one local Hedgehog. Grosshans (1983), Brockie (1959) and Yalden (1967) also recorded ants but in very small numbers, regarding their presence as incidental. In addition, four single bumblebees, identified from leg fragments, were present in four droppings.

Isopoda: Remains of at least 20 woodlice were identified in eight (36%) droppings with up to five present in a single dropping. These figures are probably an underestimate, with fragments of armoured segment seeming to indicate more individuals than were calculated by counting discernible telsons. Interestingly, incidences of the Common Rough Woodlouse *Porcellio scaber* were exclusively during the drought period with Common Shiny Woodlouse *Oniscus ascellus* exclusively after the drought broke. This may be a function of the differential humidity tolerances of the two species. Reeve (1997) noted that woodlice are never consumed in significant numbers despite being abundantly available, Brockie (1959) reporting that they were always refused by captive Hedgehogs. Yalden (1969) found isopod remains in only 2.2% of stomachs, numbers representing only 0.2% of prey animals and forming only 0.1% of prey weight. By contrast, this study found that woodlice formed 6% of prey items and 7% of prey weight.

Gastropoda: The present study found a total of five slugs in two (9%) droppings; curiously four were on 28 August, within the drought period. Though scarce in terms of frequency and, one assumes, availability, the few taken actually equalled 4% of estimated prey weight. Since structural features of these relatively heavy creatures are difficult to detect in droppings, it is likely that their presence and consequently prey weight may be under-estimated. However, with the persistently dry conditions and profound soil moisture deficit, it is likely that slug populations would have been low and their terrestrial activity much reduced. Dimelow's (1963) food preference experiments found that most species were readily accepted and all diet studies have found slugs to be consistently important. Yalden (1969) identified them in 23% of stomachs, representing 5% of prey items taken and 3% of prey weight. Campbell (1973) found slugs in 30% of droppings, Brockie (1959) in 40% and Wroot (1984) in 51%. Reeve (1994) noted that since slugs are more digestible than

arthropod prey, they could be of greater relative importance than occurrence or dietary energy figures would indicate.

Chilopoda (Centipedes): This study found single specimens of *Lithobius forficatus* on 24 July, 30 August, 11 September and 3 October. These represented 2% of prey items and 3% of prey weight. Wroot (1984) found no centipede evidence in 39 droppings, Grosshans (1983) found evidence in only two of 125 stomachs and Yalden (1969) found remains in 1.5% of stomachs representing 0.2% of prey animals and 0.1% of prey weight. Dimelow (1963) suggested their infrequency in diets may be due to their speed and ability to escape.

Diplopoda (Millipedes): Remains of only one example, those of the White-legged Snake Millipede *Tachypodoiulus niger* were located in a single dropping on 14 September, after the rains had commenced, representing less than 1% of prey items and prey weight. Normally these slow-moving creatures seem to be preferred food items and in Dimelow's (1963) food preference tests, larger specimens were immediately seized and eaten. Yalden (1969) found millipede remains in 40% of stomachs, specimens representing 11% of prey items and 3.4% of prey weight. Wroot (1984) found remains in 51% of droppings and Grosshans (1983) in 69% of stomachs. Their scarcity in this study may be related to the drought conditions.

Araneae: Single spiders, possibly of terrestrially hunting wolf spiders, identified from leg and chelicerae remains, were found in two droppings.

Opiliones: Single harvestmen, including one *Paroligolophus agrestis*, were identified from leg and cephalothorax remains in four droppings.

Feathers: Single yellow feathers, possibly body feathers from fledgling Blue Tits *Cyanistes caeruleus*, were found in three droppings. This could be evidence of scavenging on carrion, though Yalden (1967) suggested small feathers in his samples could have come from bumble bee nests raided by Hedgehogs. Since the remains of *Bombus* sp. were present in 4 droppings, one of which also contained one of the feathers, this was a possibility.

Conclusions

The extreme soil water deficit caused by the prolonged drought of 1975-76 seems to have resulted in significant changes in Hedgehog feeding strategies. Reduced availability of organisms which would otherwise have formed the staples in Hedgehog diet was probably ineffectively compensated for by the exploitation of organisms normally difficult to catch and normally avoided through being distasteful or even toxic.

Earthworms should have formed up to 13% of prey weight but were here reduced to a trace. Lepidopteran caterpillars were also substantially fewer than in other studies but, despite only accounting for 7% of prey items, they proportionally represented the second highest diet component. Slugs were also substantially fewer than in other studies, forming

1.45% of prey taken. However, due to their large individual weight relative to most arthropods in the diet, these few formed 4% of estimated prey weight and represented the fifth largest diet component. Ants, which usually only occur incidentally in diets, were here unusually the most numerous prey type due to opportunist feeding on discarded specimens from a pest control action. However, due to their very light individual weights, they only accounted for 2% of prey weight. Though centipedes are normally seldom taken, allegedly due to their speed, their relative frequency in this study may be evidence of food-deprived Hedgehogs working harder to secure whatever live prey items they encountered. Unusually high numbers of Earwigs, giving rise to a prey weight of 38%, the highest diet component in this study, may also be a compensation for the evident scarcity of staple prey types. Presumably due to drought-induced shortages of staple prey, there was evidence of Hedgehogs consuming atypical, distasteful or even toxic organisms. These included the normally avoided Devil's Coach-horse and two potentially toxic ladybirds. Though most woodlice are distasteful and normally avoided by both wild and captive Hedgehogs, here they were taken frequently, forming 7% of prey weight. Possible further evidence of food-deprived Hedgehogs in desperate quest for food was the presence of non-food items in the diets. Featuring abundantly and almost exclusively during drought conditions, they were probably inadvertently swallowed during bouts of intense foraging for prey in moss, grass and garden debris (see also Plate III, centre pages).

Acknowledgements
Thanks are due to the late Dr Peter Skidmore for beetle and Hymenoptera identifications and to John Espin-Hempsall, then Meteorologist at RAF Finningley, for meteorological data. This study is dedicated to my former landlady Annie Naylor, a keen gardener, in whose garden and home this project took place and who tolerated the hoarding of Hedgehog droppings in my bedroom.

References
Brockie, R.E. (1959) Observations on the food of the Hedgehog (*Erinaceus europaeus* L.) in New Zealand. *N.Z.J.Sci.* **2**: 121-136.
Campbell, P.A. (1973) The feeding behaviour of the Hedgehog (*Erinaceus europaeus* L.) in pastureland in New Zealand. *Proc. N.Z. Ecol. Soc*. **20**: 35-40.
Dickman, C.R. (1988) Age-related dietary change in the European Hedgehog *Erinaceus europaeus. J. Zool. Lond.* **215**: 1-14.
Dimelow, E.J. (1963) Observations on the feeding of the Hedgehog (*Erinaceus europaeus* L.) *Proc. Zool. Soc. Lond*. **141**: 291-309.
Grosshans, W. (1983) Zur Nahrung des Igels (*Erinaceus europaeus* L. 1758) Untersuchungen von Magen-Darminhalten schleswig-holsteinischer Igel. *Zool. Anz. Jena* **211**: 364-384.
Howes, C. A. (1976) Notes on Suburban Hedgehogs. *The Naturalist* **101**: 147-148.
Kruuk, H. (1964) Predators and anti-predator behaviour of black-headed gull (*Larus ridibundus* L.) *Behav. Suppl*. **11**: 1-129.
Murray, R. (1977) The 1975/76 drought over the United Kingdom: Hydrometeorological aspects. *Meteorological Magazine* **106** (1258):129-145.
Reeve, N. (1994) *Hedgehogs*. T & AD Poyser Ltd. London.

Rothschild, M. (1961) Defensive odours and Müllerian mimicry among insects. *Trans. R. Ent. Soc. Lond* **113**: 101.
Wroot, A.J. (1984) Feeding ecology of the European Hedgehog, *Erinaceus europaeus*. Unpublished Ph.D. thesis, University of London.
Yalden, D.W. (1976) The food of the Hedgehog in England. *Acta Teriol.* **21**: 401-424.

The wasps and bees (Hymenoptera: Aculeata) of two farms, Manor and Hopewell House, in Watsonian Yorkshire

Michael Archer 17 Elmfield Terrace, York YO31 1EH
email: marcher756@btinternet.com

Manor Farm (SE7665) is situated about 6km south of Malton on the Yorkshire Wolds while Hopewell House Farm (SE3759) is about 2.5km north-east of Knaresborough in the Vale of York. Both are commercial farms with Manor in arable for cereal production and Hopewell House mainly in arable for cereal production with some grazing for sheep and horses.

The field margins and triangular corners at Manor Farm have been tilled and planted with various wild flower and 'tussocky' grass mixtures or natural plant regeneration has been allowed. Hedges divide the fields and wild flowers grow in the uncultivated areas around the farm buildings. These plants (e.g. Hawthorn *Crataegus monogyna*, brambles *Rubus fruticosus*, dandelions *Taraxacum officinale*, White Dead-nettle *Lamium album*, Hogweed *Heracleum sphondylium*, Knapweed *Centaurea nigra*, Spear Thistle *Cirsium vulgare* and Creeping Thistle *Cirsium arvense*) provide pollen for bees, nectar for wasps and bees and attract prey for wasps. Vertical and horizontal dead wood with bramble in sunny situations was found in some field margins, providing nesting sites for aerial nesters as well as sunning and mating areas. The walls of some of the farm buildings had crevices which were also used by aerial nesters. In the spring male *Andrena* bees were observed on mating circuit flights along hedgerows in sunny situations. A nearby active sandstone quarry (Fox Covert Quarry) was observed to have nesting aculeates, particularly *Colletes daviesanus* nesting in large aggregations on the bare faces of the quarry and flying onto the farm field margins for food resources.

At Hopewell House Farm food resources for wasps and bees (e.g. Blackthorn *Prunus spinosa*, sallows *Salix sp.*, brambles, dandelions) are provided by flowery field margins, hedges with shrubs and trees, a marsh and flowery grassland in sunny situations around the farm buildings. Small vertical banks at the sides of farm tracks and larger vertical banks in uncultivated areas around the farm buildings provide nesting sites for subterranean

nesters. Dead wood in the marshy area around a pond and the crevices in some of the farm buildings provide nesting sites for the aerial nesters.

Methods

Nine visits were made to Manor Farm although, due to poor weather conditions, two visits were extras needed to complete the survey of the farm. Consequently seven surveys (11 April, 4+5 May, 8 May, 9 June, 24 June, 4+7 July, 3 August) were carried out between 2002 and 2009. Six visits resulting in five surveys (23 April, 20 May, 17 June, 5+8 July, 1 August) were made to Hopewell House Farm during 2010. Four visits were made to Fox Covert Quarry (8 May, 9 June, 7 July, 3 August) between 2002 and 2003. All species of aculeate wasps and bees were recorded during each survey and often collected with a hand net for later identification.

Results

Table 1 shows the number of species found and a full list is given in the Appendix. At Manor Farm 21 of the 44 and at Hopewell House Farm 15 of the 18 solitary aculeates were only found during one visit, indicating the difficulty of finding specimens. Most were found at flowers, sunning on leaves or when flying on mating circuits. At Hopewell House Farm chrysids were found searching crevices in walls in which their host *Ancistrocerus* could be nesting.

Table 1. The number of aculeate wasp and bee species recorded at Manor and Hopewell House Farms.

	Manor	**Hopewell House**
Solitary wasps	22	7
Social wasps	2	4
Solitary bees	22	11
Social bees	12	9
Total no. species	58	31

Parasitic solitary aculeates including cleptoparasites (e.g. *Chrysis impressa*, *Nomada marshamella*) and social parasites (e.g. *Bombus vestalis*) were found. There were both aerial nesters (e.g. *Ancistrocerus oviventris*, *Trypoxylon clavicerum*, *Osmia rufa*, *Megachile willughbiella*) and subterranean nesters (*Lindenius albilabris*, *Crabro cribrarius*, *Andrena scotica*, *Lasioglossum calceatum*).

Further visits would have found more species. A further six species of solitary wasps and seven species of solitary bees were found at Fox Covert Quarry and some of the solitary bees could probably be found on Manor Farm. Meek *et al.* (2002) added one solitary wasp, two social wasps and nine solitary bees at Manor Farm.

A Yorkshire quality coding for solitary aculeates can be based on the number of 1km squares in which each one has been found. As of 2010 there are four categories of more or less equal numbers of species: Rare (wasps, 1-7; bees, 1-10), Occasional (wasps, 8-23; bees, 11-27), Frequent (wasps, 24-44; bees, 29-68), Common (wasps 45-122; bees, 69-238). The solitary wasps and bees are treated separately since bees are represented by more records. Manor Farm has 31 Common, 10 Frequent and 3 Occasional (*Pompilus cinereus*, *Ectemnius sexcinctus*, *Megachile versicolor)* according to this system and Hopewell House Farm has 15 Common and 3 Frequent species.

For the solitary species Archer (1999, 2002) has developed a national quality scoring system of high and low quality scoring species. High quality species have a Scarce (equivalent to Nb), Rare (equivalent to Na) or Very Rare (equivalent to RDB) status while low quality ones have a Universal, Widespread or Restricted status. According to this national system, only Universal and Widespread species were found at Manor and Hopewell House Farms (Table 2) with a Species Quality Score (SQS) of 1.4 at Manor Farm and 1.2 at Hopewell House Farm (Table 2). If the extra species recorded by Meek *et al.* (2002) are added to the Manor Farm list, then this gives a total of 70 (68 solitary) species but the same SQS of 1.4.

Table 2. Archer's National Quality Scores of solitary wasps and bee species recorded at Manor (M) and Hopewell House (HH) Farms.

National Status	**Status Value (A)**	**No. Species (B)**		**Quality Score (A x B)**	
		M	HH	M	HH
Universal	1	28	15	28	15
Widespread	2	16	3	32	6
Total		44	18	60	21

Species Quality Scores: Manor 60/44 = 1.4; Hopewell House 21/18 = 1.2

All the social species are nationally common and widespread but Heath Bumblebee *Bombus jonellus* at Manor Farm and Barbut's Cuckoo Bee *B. barbutellus* at Manor and Hopewell House Farms could be considered as Rare in Yorkshire (Archer, 2002).

Discussion

Species Quality Scores (SQS) for semi-natural sites are relatively independent of site size (Archer, 1999). Although the number of species recorded on a site increases with its size, the numbers of high and low quality species increase together so that the SQS remains more or less constant (Archer, 1999). The SQS of semi-natural sites studied in Yorkshire can be placed into one of three classes (Archer, 2011): first class, 2.4-2.9; second class, 1.8-2.3; and third class, 1.2-1.7.

Table 3 shows the SQS of three semi-natural sites, two urban areas and the two farms considered in this study. The urban areas of Sheffield and York, despite having a large number of species, only show a second-class grade due to the relative absence of high quality species (Archer, 2009, 2012). These two areas are important refuges for the commoner, but not for the rarer, species. The SQS of the two farm sites show a third class

grade, again because of the lack of high quality species. Farms, like urban areas, have some conservation function for the commoner, but not the rarer, species. Presumably those semi-natural sites with a higher SQS meet the resource requirements of the High Quality Species which have been lost or greatly reduced and isolated in an urban or farm site. The order of conservation importance is semi-natural, urban and farm sites.

Table 3. The species quality scores (SQS) of graded sites in Watsonian Yorkshire

Site (no. species)	SQS	Grade
Semi-natural Strensall Common (98)	2.5	First class
Semi-natural Duncombe Park (71)	2.2	Second class
Semi-natural Cornelian Bay (59)	1.7	Third class
Urban Sheffield (134)	2.0	Second class
Urban York (145)	2.0	Second class
Manor farm (44)	1.4	Third class
Hopewell House farm (18)	1.2	Third class

Conclusions

No species of national importance were found at Manor and Hopewell House Farms. Two bumblebees of regional importance (Yorkshire) were found at Manor and Hopewell House Farms. The conservation interest of Manor and Hopewell House Farms is as refuge areas for the commoner bees and wasps, but in this respect they are of less importance than urban areas.

Acknowledgements

I am grateful to S. Webster of Hopewell House Farm, the Farmed Environment Company of Manor Farm and B. Meek of NERC, Centre for Ecology and Hydrology, for help, guidance and access to the farms.

References

Archer, M.E. (1999) The aculeate wasps and bees (Hymenoptera: Aculeata) of the Ainsdale-Formby sand dunes on the Lancashire coast compared with other northern sites. *British Journal of Entomology and Natural History* **12**: 1-10.

Archer, M.E. (2002) *The Wasps, Ants and Bees of Watsonian Yorkshire*. Yorkshire Naturalists' Union, York.

Archer, M.E. (2009) The solitary wasps and bees (Hymenoptera: Aculeata) of the 'Green Spaces' of urban Sheffield, *Entomologist's Monthly Magazine* **145**: 11-25.

Archer, M.E. (2011) The wasps and bees (Hym., Aculeata) of Strensall Common in Watsonian Yorkshire revisited. *Entomologist's Monthly Magazine* **147**: 33-42.

Archer, M.E. (2012) The solitary wasps and bees (Hymenoptera: Aculeata) of the 'Green Spaces' of urban York. *Entomologist's Monthly Magazine* **145**: 11-25.

Meek, B., Pywell, R., Sparks, T., Loxton, D., Carvell, C., Croxton, P., Singer, E., Gowing R., Farrant, C., Nowakowski, M & Shadrack, A. (2002) *Ecological Assessment and Monitoring of Manor Farm, N. Yorks.* Centre for Ecology and Hydrology, Huntingdon.

Appendix
'M' represents records from Manor Farm and 'HH' from Hopewell House Farm.

Solitary wasps:
Chrysis angustula (M), C. *ignita* (M, HH), C. *impressa* (M), *Trichrysis cyanea* (M), *Pompilus cinereus* (M), *Ancistrocerus oviventris* (M), *A. parietinus* (HH), *A. trifasciatus* (M), Club-horned Wood-borer Wasp *Trypoxylon clavicerum* (M), Slender-bodied Digger Wasp *Crabro cribrarius* (M, HH), *C. peltarius* (HH), *Crossocerus annulipes* (M), *C. cetratus* (M), Blunt-tailed Digger Wasp *C. dimidiatus* (HH), Slender Digger Wasp *C. elongatulus* (HH) *C. megacephalus*, (M), *C. ovalis* (M), *C. podagricus* (M), *C. quadrimaculatus* (M), *Ectemnius cavifrons* (M), *C. ruficornis* (M), *E. sexcinctus* (M), *Lindenius albilabris* (HH), *Mimumesa dahlbomi* (M), Mournful Wasp *Pemphredon lugubris* (M), Horned Black Wasp *Passaloecus corniger* (M), Field Digger Wasp *Mellinus arvensis* (M).

Social wasps: Saxon Wasp *Dolichovespula saxonica* (HH), Tree Wasp *D. sylvestris* (M, HH), German Wasp *Vespula germanica* (M, HH), Common Wasp *V. vulgaris* (HH).

Solitary bees: *Colletes daviesanus* (M), Gwynne's Mining Bee *Andrena bicolor* (HH), *A. barbilabris* (M), *A. chrysosceles* (M, HH), *A. clarkella* (M), *A. denticulata* (HH), *A. fucata* (M), Tawny Mining Bee *A. fulva* (HH), Early Mining Bee *A. haemorrhoa* (M, HH), *A. nigroaenea* (M, HH), *A. lapponica* (M), *A. scotica (*M, HH), *A. semilaevis* (M), *Halictus tumulorum* (HH), *Lasioglossum albipes* (M), Slender Mining Bee *L. calceatum* (M, HH), *L. rufitarse* (M), *L. smeathmanellum* (M), *Sphecodes geoffrellus* (M), Red Mason Bee *Osmia rufa* (M, HH), *Megachile versicolor* (M), *M. willughbiella* (M), *Nomada flava* (M, HH), Gooden's Nomad Bee *N. goodeniana* (M), Marsham's Nomad Bee *N. marshamella* (M), *N. ruficornis* (M).

Social bees: Garden Bumblebee *Bombus hortorum* (M, HH), Heath Bumblebee *B. jonellus* (M), Red-tailed Bumblebee *B. lapidarius* (M, HH), White-tailed Bumblebee *B. lucorum* (M, HH), Common Carder Bee *B. pascuorum* (M, HH), Early Bumblebee *B. pratorum* (M, HH), Buff-tailed Bumblebee *B. terrestris* (M, HH), Barbut's Cuckoo Bee *B. barbutellus* (M, HH), Gypsy Cuckoo Bumblebee *B. bohemicus* (M), Four Coloured Cuckoo Bee *B. sylvestris* (M), Vestal Cuckoo Bee *B. vestalis* (M, HH), Honey Bee *Apis mellifera* (M, HH).

YNU Bryological Section: report for 2012

T.L. Blockeel 9 Ashfurlong Close, Dore, Sheffield S17 3NN
email: Tblockeel@aol.com

Excursions

The following sectional meetings were held in 2012:

Ashberry (VC62), 5 May 2012

The YWT Reserve at Ashberry is well-known for its interesting base-rich flushes supporting Birds-eye Primrose *Primula farinosa* and we were interested to know whether the bryophyte flora was equally rich. We started the day in the vicinity of the flushes, and found *Palustriella commutata*, *Philonotis calcarea*, *Plagiomnium elatum* and *Scorpidium cossonii*, with *Campylium protensum* and *Climacium dendroides* in moist thin turf and wet ground nearby, but we saw none of the rarer species sometimes found in this habitat. However in the adjacent areas of wet woodland we recorded *Riccardia palmata* on rotten wood, a rare liverwort in Yorkshire and apparently new to the Reserve. *Nowellia curvifolia* was also present. *Dicranum montanum* was another notable find in this area, growing as an epiphyte on sallow. Epiphytes, not surprisingly, were much richer than they might have been before the amelioration of SO_2 pollution and several were additions to the Reserve. We noted *Cryphaea heteromalla*, *Metzgeria violacea*, *Orthotrichum pulchellum*, *O. stramineum*, *O. striatum* (one tuft on Ash *Fraxinus excelsior*), *Radula complanata*, *Ulota phyllantha* and *Zygodon conoideus*, among others.

Some time was spent examining the flora in the steep-sided valley of Reins Wood and Ashberry Wood. Among robust members of the ground flora were *Cirriphyllum piliferum*, *Thuidium tamariscinum*, *Plagiochila asplenioides*, *Rhytidiadelphus loreus* and *R. triquetrus*. Some of the shaded rocks and stones showed considerable calcareous influence, with *Taxiphyllum wissgrillii* and *Tortella tortuosa*, but other areas had a more or less calcifuge flora, including *Calypogeia arguta*, *Dicranum majus*, *Hookeria lucens*, *Leucobryum glaucum*, *Plagiothecium undulatum* and (on stones) *Scapania nemorea*. *Isothecium alopecuroides* and *Plagiothecium curvifolium* were noted on tree bases and old logs.

82 bryophytes were recorded in total.

Gisburn Forest, Stocks Reservoir (VC64), 6 October 2012

Stocks Reservoir is one of the classic sites for the pioneer bryophytes that colonise bare mud in the drawdown zone of reservoirs, and the autumn meeting had been organised with this in mind. Unfortunately, after the wet summer and autumn of 2012, the reservoir was brim-full and no ground at all was exposed around the margins. However, there was plenty of interest to see in the adjacent parts of Gisburn Forest. As expected, the epiphyte flora was found to be rich, and we even recorded *Orthotrichum stramineum*, *Zygodon conoideus* and *Cololejeunea minutissima* in the car park on School Lane, the latter on Horse-chestnut

Aesculus hippocastanum and only the second record for the vice-county. Additional epiphytes along the road on both sides of the causeway bridge included *Frullania dilatata*, *Radula complanata*, abundant *Metzgeria violacea* (some with capsules), *Orthotrichum lyellii*, *O. pulchellum* and *Cryphaea heteromalla*. However, the most notable record was *Colura calyptrifolia* on a sallow at the edge of the plantation south of the bridge. This liverwort has an oceanic distribution and, until recently, there was only a single Yorkshire record from rock in the ravine at Twisleton Glen, Ingleton, in 1965. In the past two decades it has been spreading eastwards (though still restricted to western regions) and now occurs widely as an epiphyte on trees in humid places, including conifer plantations.

We visited a marshy field at the edge of the conifer plantation but the vegetation was too rank for most bryophytes, although there was a little *Dicranum bonjeanii*. More interesting was some bare ground at the edge of the field, which had *Ephemerum minutissimum* with *Dicranella schreberiana* and *Bryum klinggraeffii*. We then worked up Bottoms Beck to the area where limestone rock is exposed by the track and on the stream banks. There is a lot of plantation here but also some pockets of semi-natural woodland supporting occasional luxuriant patches of bryophytes, with *Plagiochila asplenioides*, *Cirriphyllum piliferum*, *Hylocomium splendens* and *Thuidium tamariscinum*. *Nowellia curvifolia* was on a decayed log. The limestone added to the diversity, both on the track and on the rocks, with *Jungermannia atrovirens*, *Campylium protensum*, *Ctenidium molluscum*, *Gymnostomum aeruginosum*, *Homalia trichomanoides*, *Mnium stellare*, *Neckera complanata*, *Tortella tortuosa* and *Thamnobryum alopecurum*. *Lejeunea cavifolia* was found on a tree trunk by the stream.

A few weedy mosses were recorded in the car park and on the roadsides, including *Bryum ruderale* and, surprisingly, *Didymodon acutus*, which is an uncommon species normally found on bare exposed soil over chalk and limestone.

105 species were recorded on the day.

Records
The list below includes new vice-county records (*) and other records of note. The recorders were: T.L.Blockeel (TLB), G.Haycock (GH), A.J.Hodgson (AJH), S.Knight (SK), H.Lake (HL), D.G.Long (DGL), T.Ottley (TO), J.Turner (JT), C.Wall (CW).
Nomenclature follows the current British Checklist and Census Catalogue (Hill *et al.*, 2008).

Andreaea rupestris* var. *rupestris: (63*) SK195925 very sparse on millstone grit in small boulder field, Abbey Brook (Berristers Tor area), TLB, 27 December 2012.
Anomobryum concinnatum: (64) SD8371 Churn Milk Hole, TO, 20 July 2012. Rarely recorded in Yorkshire and possibly overlooked.
Bazzania trilobata: (64) SE22215168 & SE22785204 Lindley Moor GH, 27 December 2012.
Brachythecium mildeanum: (65) SE1597 in flush, Foxglove Covert LNR, Catterick Garrison, TLB & SK, 13 May 2012.

Bryum radiculosum: (62) SE9490 on wall of bridge, Langdale Bridge, TLB, 6 June 2012.

Campyliadelphus chrysophyllus: (61) SE8646 Cleaving Coombe, Londesborough, CW, 12 October 2012.

Campyliadelphus elodes: (64) SD772784 large patches in calcareous marsh, Salt Lake Quarry, Ribblehead, TLB & AJH, 23 September 2012. Occurs in calcareous mires but most often in coastal habitats. It has been recorded from the Malham Tarn area but appears to be very rare in the Dales.

Campylophyllum calcareum: (61*) TA0126 at base of chalk cliff, Humber Bridge Country Park, CW, 12 June 2012.

Cololejeunea minutissima: (63) SE0024 Cragg Vale near Mytholmroyd, TLB, and SE0125 Mytholmroyd, TLB & JT, both on willows and both 28 November 2012.

Colura calyptrifolia: (63*) SD9924 on birch and sallow, Broadhead Clough, Cragg Vale, TLB & JT, 28 November 2012;

(64) SD7778 on willow, Salt Lake Quarry, Ribblehead, TLB & AJH, 23 September 2012. The remarkable spread of *Colura* as an epiphyte continues. See the comments above in the Gisburn Forest report.

Didymodon acutus: (63*) SE055166 on calcareous gravel at edge of track, Scammonden Dam, TLB, 11 August 2012 (VC 63 Excursion)..

Ditrichum flexicaule s.str.: (64) SD7778 on limestone boulder, Salt Lake Quarry, Ribblehead, TLB & AJH, 23 September 2012; SD804655 on limestone cliff, Giggleswick Scar, TO, 17 July 2012; SD856733 on drystone wall, Giant's Grave, Pen-y-Ghent, TO, 15 July 2012.

Encalypta ciliata: (65) SD87538313 on ledges, north-facing limestone crag, Jeffery Pot Scar above Oughtershaw, DGL, 8 April 2011 (on Bradford Botany Society excursion).

Fissidens bryoides* var. *caespitans: (*63) SD974307 on stones in small rivulet, Walshaw Wood near Hardcastle Crags, JT, 3 December 2009.

Grimmia dissimulata: (64) SD797659 on crags, Giggleswick Scar, TO, 15 July 2012.

Hedwigia stellata: (63*) SE1018 probably on a wall, Laund Road, Laund Hill, Huddersfield, HL, 6 January 2012;

(64*) SE097733 on top of gritstone wall, surrounded by *Hypnum cupressiforme*, Studfold, Nidderdale, M. Adamson, 2007. *Hedwigia* is very rare in the Pennines but may be staging a slow recovery following reductions in SO_2 pollution. Nevertheless, the record from the outskirts of Huddersfield is remarkable.

Leucodon sciuroides: (61*) SE9939 on west church wall, Bishop Burton Churchyard, CW, 5 September 2012;

(63) SE001273 on a wall, Top Wood near Hebden Bridge, JT, November 2012; SE36391270 on Ash, Royston north, HL, 24 March 2012. The epiphytic record is particularly interesting as *L. sciuroides* was at one time eliminated from this habitat in Yorkshire by SO_2 pollution.

Lophocolea semiteres: (63) SE0420 on banked wall near garden, Ripponden, A. & N. Bamforth, 24 February 2012; SE3904 Darfield, HL, 11 October 2012; SE6408 in young woodland/grassland, Dunsville Quarry Park, CW, 4 July 2012.

Marsupella emarginata* var. *aquatica: (63*) SE0704 Black Hill, TLB, 8 November 2012.

Microbryum floerkeanum: (63) SE4004 Darfield, HL, 21 September 2012.

Orthotrichum pumilum: (65*) SE1697 on willow, Foxglove Covert LNR, Catterick Garrison,

TLB & SK, 13 May 2012. A nationally rare epiphytic moss.

Orthotrichum stramineum: (61) SE9772 on Beech *Fagus sylvatica*, Butterwick Whins, Weaverthorpe, CW, 30 April 2012; TA0126 on Ash, Humber Bridge Country Park, CW, 12 June 2012. *O. stramineum* is widespread in the Dales but is rarely recorded in the East Riding.

Philonotis caespitosa: (63) SE0018 Baitings Reservoir, HL, 22 September 2012.

Plagiomnium ellipticum: (63*) SK1696 in wet flush by springs on bank of stream, Upper Derwent Valley near Broadhead Clough, TLB, March 1988.

Plagiothecium curvifolium: (61) TA0139 on rotten tree stump, Burton Bushes, Beverley, CW, 3 October 2012.

Ptilium crista-castrensis: (64*) SE10524543 amongst *Hypnum jutlandicum* carpets in dry heath, Ilkley Moor, ADH, 29 February 2012. The first record of *Ptilium* in VC64 since it was reported near Settle in 1840! It is a boreal forest moss which is very rare in England.

Pylaisia polyantha: (63*) SE04941657 on Sycamore *Acer psudoplatanus*, Scammonden Water (north), TLB, 11 August 2012.

Racomitrium elongatum: (65*) NY8428 Cronkley Fell, TLB & AJH, 4 June 2012; SE0294 Apedale, SK, 26 March 2012.

Racomitrium ericoides: (63*) SD9727 on wall top, Blackshaw Head, near Hedben Bridge, JT, 2010.

Rhabdoweisia crenulata: (64) SD7074 on face of silurian rock on stream bank, Twisleton Glen, Ingleton, TLB *et al.*, 1 December 2012. Rediscovery at the site of the only previous VC64 record, made in 1960.

Riccardia palmata: (62) SE9187 on rotten logs in marsh, Troutsdale Brow, TLB, 6 June 2012.

Scapania degenii: (65) NY8628 at edge of *Scorpidium*-flush, Cronkley (east), TLB & AJH, 4 June 2012. This montane liverwort is very rare south of Scotland and confirmation of its continued presence in VC65 is very welcome.

***Schistidium rivulare* s.str.**: (63) SE0118 Baitings Reservoir, HL, 22 September 2012; SE0218 Ryburn Reservoir, HL, 10 September 2012; SE0717 Outlane, HL, 12 July 2012.

Schistidium robustum: (64) SD7778 on limestone boulder, Salt Lake Quarry, Ribblehead, TLB & AJH, 23 September 2012; SD835718 on limestone boulder, Pen-y-Ghent: Churn Milk Hole, TO, 20 July 2012;
(65) NY8328 Cronkley Scar, TLB & AJH, 4 June 2012.

Schistidium strictum: (64) SD841733 on boulders below cliffs, Pen-y-Ghent, TO, 20 July 2012.

Schistidium trichodon: (65) NY8328 Cronkley Scar, TLB & AJH, 4 June 2012.

Solenostoma hyalinum: (64) SD749568 on bank at edge of path, Gisburn Forest, TO, 18 July 2012.

Sphagnum girgensohnii: (63) SK284865 on a low earth ledge at side of footpath, Allen Sike, Wyming Brook, O. Pescott, 3 November 2012.

Sphagnum magellanicum: (63*) SE7215 southern canals, Thorne Moors, I. McDonald, 20 August 2012. This is thought to be a survivor of experimental transplants made in the early 1980s. It appears to be spreading slowly.

Sphagnum warnstorfii: (65) NY8628 Cronkley (east), TLB & AJH, 4 June 2012.

Syntrichia virescens: (61) SE7254 on willow, roadside nr. Stamford Bridge, CW, 7 November 2012; SE8150 on Elder *Sambucus niger*, Pocklington Wood, CW, 19 October 2012; SE8245 epiphyte on tree, Hayton village, CW, 12 October 2012; SE9843 on gravestone, Etton Churchyard, CW, 5 September 2012; SE9936 on cherry, Walkington Churchyard, CW, 5 September 2012;
(63) SK2998 on planted(?) tree, Deepcar, HL, 8 May 2012.
Tortella bambergeri: (64) SD7074 Twisleton Glen, Ingleton, TLB *et al.*, 1 December 2012; SD842733 on small rocks below cliff, Pen-y-Ghent, TO, 20 July 2012.
Tortella densa: (65) NY8428 Cronkley Fell, TLB & AJH, 4 June 2012.
Zygodon rupestris: (63*) SK195926 very sparse on millstone grit in small boulder field, Abbey Brook (Berristers Tor area), TLB, 27 December 2012.

Corrections to Report for 2009-2011

This report (Blockeel & Wall, 2012) contained several incorrect grid references caused by a formatting error. They are corrected here:
Kurzia trichoclados: (63) Holme, HL, 28 September 2009, correct grid reference is SE1105.
Lophocolea semiteres: (63) Finningley Sand Pit, CW, 31 March 2010, correct grid reference is SK6697.
Orthotrichum sprucei: (64) R. Wharfe near Weeton, TLB, 1 February 2011, correct grid reference is SE3046.
Orthotrichum stramineum: (63) Slaithwaite, HL, 19 March 2011, correct grid reference is SE0814.

References

Blockeel, T.L. & Wall, C. (2012) Y.N.U. Bryological section: report for 2009-2011. *The Naturalist* 137: 148-155.

Hill, M.O., Blackstock, T.H., Long, D.G. & Rothero, G.P. (2008) *A checklist and census catalogue of British and Irish bryophytes, updated 2008.* Middlewich: British Bryological Society.

Field note: Osprey attacked by Tawny Owl

On 5 May 2013, I was patrolling the trout lake at Bellflask Fishery near Ripon; five anglers were present and at 10.15 an Osprey *Pandion haliaetus* appeared overhead. The surface of the water was markedly rippled by the strong wind. The bird circled the main lake and two other adjacent lakes for 15 minutes, hovering several times but only once making a serious dive into the water, which resulted in it being almost completely submerged except for the tips of the primaries in one wing (Fig.1). The dive was unsuccessful and, after much flapping, the Osprey eventually took to the air without a fish.

Figure 1. Osprey just visible above the water after diving for a fish *B.Morland*

Whilst circling the lakes, it was intermittently mobbed by two Oystercatchers *Haematopus ostralegus*, Black-headed Gulls *Chroicocephalus ridibundus*, Jackdaws *Corvus monedula*, Rooks *C. frugilegus* (from a nearby rookery), Carrion Crows *C. corone and* Sand Martins *Riparia riparia.*

The Osprey then switched its attention to fishing the River Ure which runs alongside the fishery and where it was free from the attentions of other birds. Immediately to the north the river runs through a gorge, flanked on the closer left bank by a high terrace on which is a large wood, primarily alder carr with a stand of mature conifers covering several acres. The Osprey hovered over the river at a point where the conifers flank the edge of the terrace and where the banking drops almost vertically to the river below. At this point it was only about 20ft above the level of the conifers.

As I watched, the unmistakable rounded shape of a Tawny Owl *Strix aluco* suddenly appeared from the conifers and flew straight at the Osprey, causing it to react instantly to avoid being hit. The owl turned and attacked a second time before returning out of sight into the conifer plantation. The owl attack was completely different from the earlier persistent, but merely irritating, mobbing by the other species and there is no doubt that, had the Osprey not reacted instantly to avoid the owl, it would have been struck violently.

One would assume that the owl had fledged young in the conifers and felt threatened by what must have been a most unusual and unexpected close encounter with a large predator. Following the incident, the Osprey rose to a great height before drifting back downstream and over the fishing lakes again. Osprey activity was noted at Bellflask on nine separate occasions during April and early May this year, a lake full of trout being a great attraction.

Brian Morland Bellflask House, East Tanfield, Ripon HG4 5LW

ꞵook Review

ꞵuide to Freshwater Invertebrates by **Michael Dobson, Simon Pauley, Melanie Fletcher** ınd **Anne Powell.** Pp216. Published by Freshwater Biological Association, Ambleside, 2012. :33.00 hardback.

'his is an excellent little book for the serious novice who wants to get a thorough start in reshwater invertebrate identification. It is intended as a replacement for T. T. Macan's *A ꞵuide to Freshwater Invertebrate Animals* and the preliminary pages, outlining the life and vork of T.T. Macan, make an interesting and informative opening. The book will fit nicely nto a rucksack so that it can be used in the field and will clean up easily if it gets splashed.

'here is a good introduction to the responsible collecting and preserving of specimens. It is ıice to see a modern book, aimed at beginners, that is not squeamish about the need to kill pecimens. The introduction includes a short section on how to look at specimens using nicroscopes and there are occasional tips in the keys about handling specimens; e.g. prodding' snails for the presence of an operculum and caddis larvae for sclerites. There is lso a nice simple introduction to the taxonomic hierarchy and how classification works, ncluding an explanation of why some of those annoying name changes occur.

'he keys form the major portion of the book and take different groups of animals to ifferent identification levels; generally to family (though in some instances only to hylum); but in some instances genus and even species level identifications are possible. 'he figures amply complement the text and the use of coloured arrows nicely highlights the pecific points being illustrated. The only point in the keys which I thought might cause onfusion is the question about the relative lengths of the tarsal segments at the beginning f the stonefly key. The wording of the triplet is ambiguous and requires careful scrutiny of he illustrations. This is something which is very difficult to describe in a few words and equires careful comparison of the specimen with the associated illustrations, which are ood. The illustrated glossary at the back is a very useful feature of this book and one which would like to see in others.

he book closes with pointers to providers of identification training, an introduction to iological recording and a bibliography of guides to the more accurate identification of nany of the groups.

he book has been a pleasure to review. As a user (and teacher) of many keys on reshwater life for nearly 20 years, I found the book refreshing, usable, concise and clear. : is a testament to the hands-on experience of the authors and should prove a popular and ewarding book, which should inspire further investigation of freshwater organisms using nore in-depth taxonomic material.

SF

Yorkshire Naturalists' Union
Annual General Meeting

The YNU AGM will take place in the Farndale Room at the Palm Court Hotel in Scarborough on **Saturday 16th November 2013** from 2.00pm to 4.30pm.

The welcome address will be given by the Whitby Naturalists' Club, who celebrate their centenary this year. YNU President John Newbould will give a Presidential address entitled *What should natural history societies do?* Scarborough Field Naturalists' Society will close the proceedings.
There will be a meeting of the Natural Sciences Forum from 11.30am to 12.45pm, which everyone is welcome to attend, with refreshments available from 11.00am. Please let us know if you plan to attend this meeting so that we can ensure sufficient seating is available – contact the Natural Sciences Forum secretary Paula Lightfoot on p.lightfoot@btinternet.com or 01904 449675.

Venue:	Palm Court Hotel, St. Nicholas Cliff, Scarborough, North Yorkshire, YO11 2ES
Transport:	Scarborough is accessible by bus and train. There is a multi-storey pay and display car park next to the hotel, which costs £1.40 per hour or £6.60 all day
Lunch:	A hot buffet lunch will be provided at 1.00pm in the Palm Court Hotel restaurant at £11.95 per person and will include vegetarian options. If you would like to book lunch at the AGM, please contact the YNU's Administrative Officer Claire Neill on membership@ynu.org.uk or c/o NEYEDC, St William's College, 5 College Street, York, YO1 7JF, or book online at www.ynu.org.uk

YNU Notice

Online recording now available on the YNU website

In the December 2012 issue of *The Naturalist* we reported that the Yorkshire Naturalists' Union had been awarded funding through the OPAL Grants Scheme to add online recording functionality to the YNU website. We are pleased to announce that the online recording pages have now been added to the YNU website and can be found at www.ynu.org.uk/recording_wildlife.

The data entry forms were designed with input from all of the YNU Sections. There was a trade-off between keeping the user experience as straightforward as possible and ensuring that all relevant data fields are captured. It was agreed that there should be three forms:

- A simple 'submit a sighting' form.
- A multi-taxa recording form for the freshwater/terrestrial environment, with two separate tables, one for recording animals and one for recording plants, fungi, lichens and galls.
- A multi-taxa recording form for the intertidal environment.

hese recording forms can be used to submit records to the YNU of any species seen in orkshire. The records will be stored securely in a database managed by the Biological ecords Centre at CEH Wallingford, where they will be made available to local nvironmental records centres and national recording schemes via the iRecord website www.brc.ac.uk/iRecord). Once they have been verified, records will be shared via the NBN ateway so that they can be used to support education, research and environmental ecision-making, in accordance with the YNU's Data Policy (*The Naturalist*, 136 239-240).

training day was held at the University of York in April to enable YNU recorders to use Record to access and verify records submitted online. This was attended by ten YNU ecorders with expertise in Mollusca, Lepidoptera, Fungi, Orthoptera, Hymenoptera and arious smaller freshwater and terrestrial invertebrate orders. We hope to run another aining session in the Autumn/Winter and we can arrange one-to-one training in the eantime for anyone who would like to verify records online.

you have any questions about the site, or suggestions for improvement, or if you would ke to verify records of a particular group of species in Yorkshire, please contact Paula ghtfoot on p.lightfoot@btinternet.com.

etters to the Editors - Scientific names

rom **Dr Elva Robinson, University of York:**

write in response to the Editorial in the April 2013 edition of *The Naturalist*, concerning aming systems used in the publication. I support the emphasis on accessibility put forward y the Editorial Board and agree that the use of English names can be very beneficial in erms of public engagement. However, we must be careful that we do not let this worthy m unnecessarily limit the wider value of contributions to *The Naturalist*. Two major dvantages of the scientific binomial names (very accessibly introduced in the Editorial) are hat it is internationally meaningful and that it is stable over time, with changes properly ocumented. Regarding the first of these, while contributions to *The Naturalist* may be of ost interest to those working in Yorkshire, many may also be of use to the wider scientific

community, for example in assessing a reduction or expansion of a species' range across Europe, or in charting long-term abundance patterns. For these purposes, the common names are less suitable. Let us take the example of two well-known birds: the Goldfinch *Carduelis carduelis* and the Bulfinch *Pyrrhula pyrrhula*. In Dutch, our Goldfinch is the *Distelvink*, or thistle-finch, while our Bulfinch is the *Goudvink*, or gold-finch. Such possibilities for confusion occur in many groups but are easily avoidable by using the scientific names in addition to the common names. Secondly, as the Editorial stated, common names may change over time. The NBN Gateway is cited as a source for linking common to scientific names. This is fine currently but, if these records are to be used as historical data in 50 or 100 years time, will this resource still be available and will any changes in the common names be easily traceable? The Editorial finishes by stating the intention to remove scientific names from the Excursion Reports for some groups (e.g. birds) and asking the opinions of the readership on the suggestion to widen this to other groups. My response is that to drop the scientific names reduces the wider and long-term value of the Excursion Reports, whereas using both English and scientific names together allows wider value without significant cost to accessibility.

From **David Baker**, 19 Woodlands Avenue, Tadcaster, North Yorkshire, LS24 9LE:

I read with interest the Editorial in the latest volume 1082 of *The Naturalist* which ended by asking us what we think of the use of scientific names for our Flora and Fauna. Firstly, I thank you for not using the phrase "Latin names", which I hear all too often in Lepidopteran circles. I certainly prefer the present usage of vernacular followed by scientific name in the first instance for all situations and show, I hope, two reasons for my reasoning whilst using the same volume as an example.

The article on page 18 shows lists of "Native species" of vascular plants without any of the long-accepted vernacular names and, to me, was almost unintelligible. For example, I and many non-specialists will be aware of *Geranium* and *Potentilla* as generic names but the specifics are not as well known. I do understand that space was possibly at a premium in the article but the common names of Round-leaved Crane's-bill or Hoary Cinquefoil may well have kept my interest.

Further into the magazine, on page 56 under the Lepidoptera paragraph, line 12 records the sighting of a <u>Muslim</u> Footman *Nudaria mundana*. Perhaps Aladdin was showing in the local theatre? However, joking apart, the use of the scientific name allows a double check for anyone not realising immediately that it was merely the result of a printing or proof-reading error and that Muslin Footman was the macromoth in question. Yes, I have grown up knowing the vernacular names of many of our birds, mammals, flowers and butterflies without having to resort to learning the scientific names. It was not until establishing a more detailed interest in moths that I learnt the scientific names for many more of our flora and fauna and realised their true value.

Please retain the use of both names where the vernacular is commonly accepted, even to the point of using the proposed "new common" names for all the micromoths if the existing proposals are accepted. At least we shall still have a world-wide scientific name to identify our moths by.

Editors' note: In the case of the Red Data Book plant lists, the decision not to add vernacular names was made purely on the grounds of space – it would have been impossible to add an extra column to the tables and still maintain their legibility without putting them into landscape format. This would have been difficult to organise given that each of the many tables had introductory text. As the article was largely aimed at specialist botanists it was felt that it was better, on balance, to publish it as submitted.

Book review

A History of the Whitby Naturalists' Club by **Mike Yates**, written for the Club's 2013 Centenary & edited by **David Minter**. 2012. Pp. 90, incl. numerous b/w illus. Not for sale, but free to Members of the Whitby Naturalists' Club: a membership form can be downloaded from the Club's website at: www.whitbynaturalists.co.uk

An examination of documents in the Club's archives to put on to the internet also resulted in this interesting booklet which encapsulates 100 years of one of Yorkshire's many successful natural history societies. Selecting the material for this publication cannot have been easy as it required reading and photographing more than 6000 pages of Club minutes, reports and *Whitby Gazette* cuttings. As a result, this is a fitting testimony to the many devoted enthusiasts who have contributed significantly to the Club's success and to our knowledge of the natural history, geology and archaeology of one of the county's most iconic landscapes. The text is essentially chronological, the first eight chapters covering the establishment of the Club through to the 1980s, followed by four chapters on the building of the Kendall Memorial Room, the Botanical Section, the Archaeological Section, and relations with the Literary & Philosophical Society, and concluding with two chapters on the period 1987-2012. Members of the YNU will be particularly interested in the biographical details as well as the field meetings contained in this work. Today the Club has ten special interest groups: Amphibians & Reptiles, Archaeology, Botany, Entomology, Fungi, Geology, Local History, Mammals, Ornithology, and Sea & Shore Life. Membership is open to anyone interested in furthering the Club's aims (conservation, maintenance of a library & systematic recording) and activities (exhibitions, field meetings, lectures & workshops).

MRDS

YNU Calendar August – November 2013

Further information can be found at www.ynu.org.uk/events/calendar

Aug	24	Botanical Field Meeting VC65 10:30am nr Leyburn. Meet on roadside at SE105910.
Sep	1	Conchological Section Field Meeting 10:30am-1pm. Meet at the car park on S. side of minor road at NZ931046. 1km recording on the NY Moors near Robin Hood's Bay.
	8	Shore Thing Survey at North Landing. Flamborough. 11am – 1pm. Meet at the bottom of the slipway (TA239720).
	21	Marine and Coastal & Conchological Sections joint Field Meeting 9:30am – 1:30pm. Meet at Sea Cliff Road car park, Scarborough (TA049867).
Oct	5	Marine and Coastal Field Meeting 9:30am – 11:30am. Meet at the bottom of Mill Bank (NZ955040). Joint meeting with the Society of Biology.
	5	Bryological Section Field Meeting 10am – noon. Meet at Ponden, on the roadside at SD984376.
	5	Conchological Section Field Meeting 10:30am – 1:00pm. Meet at the side of the road near the pond in Fridaythorpe village at SE875591.
	6	Marine and Coastal Field Meeting at Boggle Hole 9:30am – 11:30am. Meet at the bottom of Mill Bank (NZ955040) Joint meeting with the Whitby Naturalists' Club.
	12	Natural Sciences Forum meeting 10:00am – 12:30pm at St Chad's, Headingley. The Forum exists to ensure that the YNU achieves its charitable objectives of studying and recording the natural history of Yorkshire and disseminating its knowledge to others. We welcome to meetings any YNU members and guests wishing to contribute ideas for the development of the YNU and willing to take action to deliver them. Contact: Peter Flint via: flintsentomologists@btinternet.com
	12	Entomological Section Meeting 11am. Recorders' Reports, Conversazione. Doncaster Museum & Art Gallery.
	13	Historical Section Meeting 11:00am – 4:30pm at Walton Hall nr Wakefield. AGM and work in progress.
	20	Marine and Coastal Field Meeting Flamborough 10:30am – noon. Meet at the bottom of South Sea Road where it meets the beach (TA230692). Shore Thing survey followed by a visit to Yorkshire Wildlife Trust's Living Seas Centre.
	26	Executive Meeting 10:00am – 12:30pm at St. Chad's Parish Hall, Leeds.
	26	Conchological Section AGM 1pm – 4pm 17 West Park Drive, Leeds, LS16 5BL.
	26	Education Committee Meeting (provisional date)
Nov	16	**YNU AGM** (2pm to 4:30pm) & Natural Sciences Forum (10am to noon). Palm Court Hotel, Scarborough. See box p156 for details.

Yorkshire Naturalists' Union

c/o NEYEDC, St William College, 5 College Street, York YO1 7JF
Tel: 01904 641631 Email: membership@ynu.org.uk
Website: www.ynu.org.uk
Registered Charity No. 224018

The Naturalist

s publication is issued free to individual members of the Yorkshire Naturalists' Union and to liated Societies. The Editorial Board of *The Naturalist* is currently:

tice to contributors

itributors should indicate whether they wish their manuscripts to be subjected to anonymous peer review. other manuscripts will be reviewed by the Editorial Board who at their discretion may send them to third ies for comment and advice.

jinal articles should be submitted electronically as an MS Word document to Dr A. Millard at illard@leedsmet.ac.uk.

ase see *The Naturalist Guide to Consistency* on p77 of *The Naturalist* 1079 and please **avoid** the wing:

- using tabs to tabulate information (please use MS Word table format or separate the column entries in a single row with commas and enter a paragraph mark at the end of the row).
- inserting any figures, graphs or plates into the text; indicate their proposed locations in the text and send as separate files.

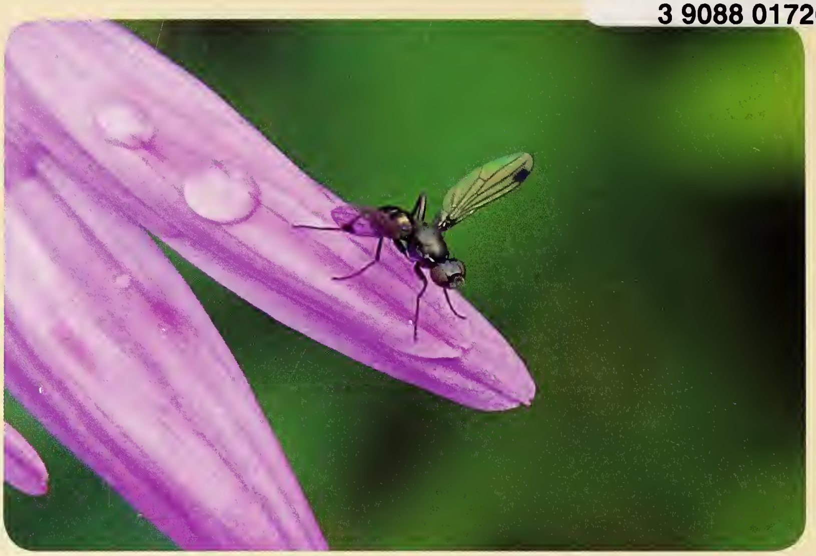
od quality, high resolution images are very welcome and should be sent as .jpg files, with a separate MS d file containing the caption and name of the person to whom the image should be attributed.

ectronic submission is not possible, contributions should be sent to Dr. A. Millard, Woodland Villas, 86 helor Lane, Horsforth, Leeds LS18 5NF (Tel. 0113 258 2482)

tributors should ensure the accuracy of reference citations. The Editorial Board and Council accept no onsibility for opinions expressed by contributors.

y Dates:
l issue - **14 February**; August issue - **14 June**; December issue - **14 October**

ISSN 0028-0771



Yorkshire Naturalists' Union

MIX
Paper from responsible sources
FSC www.fsc.org FSC® C012290

DUFFIELD digital
Printed by Duffield Digital
www.duffieldprinters.co.uk

The Naturalist

cember 2013
ume 138
mber 1084

Yorkshire Naturalists' Union

urnal of Natural History for the North of England

The Naturalist

Vol. 138 No. 1084 December 2013

Contents

An asterisk* indicates a peer-reviewed paper

Front cover: Detail from the *Light of Creation* window, St. Chad's Church, Far Headingley, showing various animals and plants (see p220). Photo: *Jill Lucas*

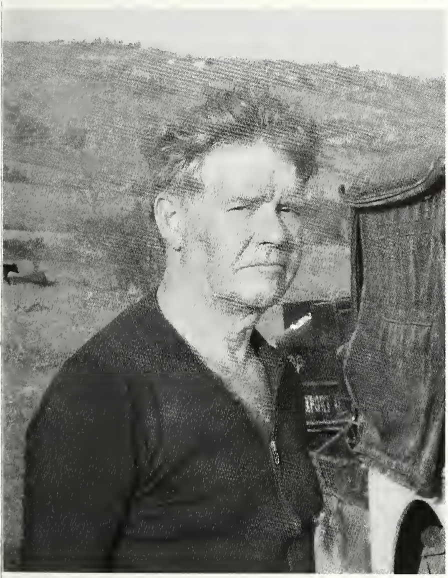
Back cover: Thistle Broomrape *Orobanche reticulata* growing in the Ox Close Wood Nature Reserve (see p212). Photo: *Margaret Moseley*

Yorkshire Naturalists' Union

The Naturalist

December 2013 Volume 138 Number 1084

Terry Whitaker, President of the YNU 2013-2014 - an informal biography



I was born in Leeds in September 1947 but as my parents moved around the country I lived in Leicestershire, Derbyshire, Warwickshire and Aberystwyth. My interest in natural history started in Hillmorton, then a rural village on the outskirts of Rugby, where I developed an early interest in wild flowers, raised Grass Snakes and, though now ashamed to admit it, indulged in minor birds' egg collecting. Moving to Aberystwyth I explored the then unspoiled countryside and mountains of West Wales. The seashore was a new and fascinating experience. I fished the rivers and shot in the woods, often in the company of much older countrymen who were great observers of the natural world. As a teenager I bicycled into the hills to observe the nests of the remaining six pairs of UK Red Kites, down to Aberaeron to see the first Collared Doves and explored the many local lead mines with my bike lamp. On field meetings with members of the West Wales Naturalists I met William (Bill) Condry who became a natural history rôle model for me. At this time he was warden of Ynys-hir RSPB Reserve and writing his book on the Snowdonia National Park which became a classic in the Collins New Naturalist series. My obsession with butterflies and moths developed, raising caterpillars of the then common Garden Tiger, Oak Eggar and Lackey moths. As a grammar school boy I bought a mercury vapour light moth trap and also ran a RIS trap for two years.

Returning to Yorkshire to take Zoology at Leeds University, I spent more time in running the caving club and walking in the Yorkshire Dales than in academic endeavour. At this time I met and became firm friends with a then junior lecturer, Stephen Sutton, who fostered my interest in entomology and expeditions. On leaving Leeds with a mediocre degree and after a spell as a machinist in an engineering works, I went to Wolverhampton Polytechnic to do MIBiol in entomology. My work experience for the course was in the Entomology Department at Rothamsted Experimental Station. This was an inspiring experience. At that time C B Williams was departmental head and the numerical ecologists Roy Taylor and Trevor Lewis were working just down the corridor. Ian Woiwod was then a junior assistant and drinking companion. Having once said I had no interest in marine biology and wanted to work on crop pests, I logically found employment with the British Antarctic Survey as a marine biologist in a fisheries research group where I worked on marine phytoplankton ecology and seawater chemistry and had eleven splendid years seeing most of the interesting animals of the Falkland Islands and the Antarctic Peninsula. During this time I made good academically by writing up my researches for a PhD in Botany at the University of London.

The pull of 'God's own county' eventually overcame the delights of the agricultural desert that is the countryside around Cambridge and I moved to the borders of the Yorkshire Dales where I needed to earn my living as a builder. However, I was able to indulge in caving and walking and get paid for my natural history interests by doing occasional work for English Nature and the Yorkshire Dales National Park. Imagine my surprise at finding that my once junior lecturer, Stephen Sutton, was living just up the road. He was now a senior academic and a President of the YNU and writing Sutton & Beaumont's *Moths and Butterflies of Yorkshire*. He set my feet firmly back into Lepidopteran studies, mainly in Southeast Asia.

Since then I have been exploring the natural history delights of the Dales, interspersed with sporadic caving expeditions world-wide and more regular visits to the Cantabrian Mountains. In the last ten years I became involved full time in biological consultancy and started a project to produce a definitive pictorial guide to the pyralid and thyridid moths of Borneo. Recently I have been involved with Australian, Malaysian and Chinese colleagues in the lepidopteran components of major biodiversity studies in Borneo and China.

Currently I am still avoiding becoming formally retired due to the syndrome of the 'rolling stone having gathered no moss' and I am still working on conservation and survey projects, some paid and some voluntary, in the Dales and around my midwinter home at Matienzo in the Cantabrian Mountains. Like all true biological organisms the Bornean pyralid moth project is now evolving into a web-based identification and taxonomy site (http://www.pyralidsofborneo.org/) which will enable me to while away my dotage in front of a hot computer, happily uploading new descriptions.

River Aire Fish Populations 2012

Kevin Sunderland Bingley
ksunderland@ksunderland.fsnet.co.uk

Introduction

The last list of fish in the River Aire was *The Fishes of Upper Airedale* by Wm H Whitaker of Utley (Whitaker 1910). It was far easier to compile an accurate list at that time as there were thought to be no fish populations downstream of Shipley where the grossly polluted Bradford Beck entered the river. The information shown below has been mainly derived from recent Environment Agency (EA) reports, press articles, records in libraries, conversations with anglers and personal observations. A great source of historical information has been the *Pollution Commission Report* (Pollution Commission, 1867). A number of the paragraphs of this report are referred to in this article.

Many stretches of the Aire are relatively inaccessible and remain seldom fished and little surveyed by the EA. This leads to information being biased towards other areas which can then result in omissions of some fish populations. However, it is hoped that the information given here will help to give a reasonable view of the position in 2013.

The typical zonation of Yorkshire rivers, with trout in the higher reaches and Roach *Rutilus rutilus* in the lower reaches is disrupted in the Aire by the presence of thirty or so weirs. These have a big effect on the fish populations due to their pooling effect. The species of fish in the slow deep water above a weir may be completely different to those in the shallow fast water below it.

Current Position

As recently as 1974, Dr D J Shilcock, the then Fisheries Officer for the Yorkshire Water Authority, stated that the fishery on the Aire ended at Esholt (Bradford) and below that there were only sticklebacks (Shilcock, 1974). Since that time, particularly over the last twenty years, there has been a huge improvement in the water quality and there are now fish populations all the way down the river and in most of the tributary becks which flow into it. Investment in sewage treatment, work on combined sewer overflows, regulation of industrial discharges and the collapse of the textile and other polluting industries have all accounted for this improvement.

Two major developments have recently taken place which will have great bearing on future fish populations. One of these is the upgrading of the sewage treatment works at Esholt, Bradford, and Knostrop, Leeds. This work was brought about by the European Freshwater Fish Directive and the primary purpose was to reduce ammonia levels in the effluent from the works. The £75 million scheme at Esholt was completed in late summer 2009 and the staged improvements at Knostrop shortly afterwards.

The other major development is the Humber District Plan of the European Water Framework Directive (WFD), which was signed off by the Secretary of State for the Environment in December 2009. The WFD addresses many problems in Europe's rivers. The EA's commitments in the Humber District Plan include the removal of all artificial barriers to fish migration and the return to all the Humber Region rivers of self-sustaining spawning populations of migratory fish by 2021.

Weirs, hydros and fish passes

Although corn milling weirs have been present on the River Aire since Norman times, it was the Aire and Calder Navigation, founded in 1699, and the Industrial Revolution which followed it, that led to additional and better-maintained weirs being built. These weirs eventually led to the demise of migratory salmonids in the Aire. As mentioned above, the WFD is expected to deal with most of the problematic weirs during the period to 2021. At the present time there are fish passes on the weirs at Fleet, Lemonroyd, Rothwell, Thwaite Mills, Castleford and Rodley . The fish pass at Castleford (See Plate I, centre pages) was opened in 2007 and the one at Rodley as recently as late autumn 2012.

The once very difficult task of restoring migratory fish to the Aire has been made far easier by the removal of numerous weirs. Some were removed for flood relief and drainage purposes whilst others have collapsed and have been removed by the forces of nature. Historic weirs which no longer exist were found at Hunslet Old Mill, Calverley, Esholt Hall, Upper Esholt, Buck Woods, Dowley Gap, East Riddlesden, Stockbridge, Silsden Bridge, Cononley Bridge, Carleton Bridge, Inghey Bridge and Aireton. A list of weirs in 1867 can be found in paragraph 5779 of the *Pollution Commission Report* (1867: para 5779).

The announcement by HM Government on 7 February 2013 that funding has been made available for the Leeds Flood Alleviation Scheme has huge implications for the migratory fish populations of the river. The scheme, scheduled to commence in 2014, includes the removal of the weirs at Crown Point and Knostrop in Leeds. They will be replaced by movable weirs which will include fish passes. As Knostrop Weir has been a virtually impassable barrier to migratory fish, its alteration should have a hugely beneficial effect. Once Knostrop Weir has been altered, the remaining major barrier below Leeds will be the Canal and River Trust's weir at Knottingley, where fish have to wait for suitably high flows before they can ascend. An expression of interest in putting a hydro (a hydro-electricity turbine) on Knottingley Weir meant that Government funding could not be used for a fish pass there as the hydro operator would have been obliged to pay for it. The hydro operator has now decided to withdraw its interest, so funding sources for a fish pass can now be looked for by the Canal and River Trust and other interested parties.

Previous Records

There are few available records of the fish populations prior to the onset of the massive increase in pollution which took place from 1830 to 1850. The best records relate to the Keighley area and the first of these was made by the Reverend Miles Gale, rector of

:eighley from 1680 to 1720. In his manuscript of c1690 but published many years later Gale, 1815), he stated that in 1690 the local River Aire contained Dace *Leuciscus leuciscus*, ;rayling *Thymallus thymallus*, Minnow *Phoxinus phoxinus*, Perch *Perca fluviatilis*, Eel *\nguilla anguilla*, Gudgeon *Gobio gobio*, Brown Trout *Salmo trutta*, Smelt (Salmon Smolt) ınd Salmon *Salmo salar*.

\n anonymous contributor to *The History of the Loyal Town of Ripon* (Gent, 1733) onfirmed the above fish to be still present in the vicinity of Keighley but also added Three-pined Stickleback *Gasterosteus aculeatus*, Ruffe *Gymnocephalus cernuus*, Chub *Squalius ephalus*, Bullhead *Cottus gobio* and Pike *Esox lucius*. This list stated that the Aire at :eighley "affords Dares, Gralings, Menards, Bonestrickles, Pearch, Eels, Gudgeons, Ruff, :hub, Trout, Salmon and Salmon-Smelts: The former, when out of season, come up the iver to spawn, and return into the salt water again. There is plenty of Millers Thumb and 'ike, which the River was first stocked with by Mr Tempest's Fish Pond of Broughton, ıreaking into the River".

:eighley (1858) compared the fish populations in 1858 with those in 1733. He pointed out hat Grayling, Ruffe, Salmon and Salmon Smelts had all disappeared and that Dace were ıow seldom caught, but that these fish had been replaced by an abundance of Roach and ome Freshwater Crayfish *Austropotamobius pallipes*. He describes the bursting of a entleman's pond as having caused the introduction of Roach to the Aire around Keighley nd claims that Crayfish were introduced into a small brook near Steeton by Mr Garforth of teeton Hall.

ι number of references to fish species in the Aire was made in the *Pollution Commission 'eport* (1867). In paragraphs 5481 onwards, William Ferrand stated that he regularly fished he river in Bingley from 1817 to 1826 and that the river contained vast quantities of Brown 'rout, Grayling, Eel and Freshwater Crayfish. The abundance of trout at Cottingley Bridge ıear Bingley) in 1820 was confirmed by the observations of a member of the Busfeild amily[1].

)ue to physical modifications made to the river in the mid 19th century, the fish ıopulations may never return as formerly. In a number of areas the river has been traightened or deepened. Above Keighley a number of meanders have been taken out and /eirs removed, causing the river to flow straighter and faster. Much of the work was arried out by the Airedale Drainage Company and has resulted in the surface water being ɔwered by an average of four feet between Stockbridge, Keighley, and Skipton (Pollution :ommission, 1867, para. 5515). The alterations probably made the habitat more suitable ɔr salmonids and less suitable for some coarse fish although the effect of this was not oticeable until pollution was alleviated in the late 20th century. As water quality improved

Ferrand and Busfeild family histories and notes on Bingley etc. Page 48. Probably written in the 870s by a son or daughter of Currer Fothergill Busfeild. (Box 6, Bingley Collection, Bingley Library).

there was a rapid expansion of trout and Grayling numbers and a decline in coarse fish populations.

Species accounts - fish

River Lamprey *Lampetra fluviatilis*. The Goole naturalist Thomas Bunker recorded this migratory fish from the Aire and the Ouse in the 1880s (Bunting *et al.*, 1974). As far as is known, there are no confirmed records of migratory Lampreys in the non-tidal River Aire. Lamprey are found in the other Yorkshire rivers, but as this fish does not take anglers' baits its presence can remain undetected. As weirs are fitted with fish passes and water quality continues to improve, it may well be that River and Sea Lampreys will be found in the Aire.

In February 2008, a local angler fishing in the Aire at Stockbridge, Keighley, caught a pike which then regurgitated a half-digested River Lamprey (pers. comm.). Whether the Lamprey was a bait previously discarded by another angler or was the first evidence of River Lampreys returning to the Aire remains to be seen.

Sea Lamprey *Petromyzon marinus*. This migratory fish occurred in the Aire, presumably in the lower reaches, during the 19th century (Miall, 1890).

Brook Lamprey *Lampetra planeri*. This non-migratory lamprey would appear to have always existed in the Aire catchment. A report in *The Bradford Scientific Journal* (Anon, 1912) stated that several small lamperns (Brook Lampreys from the description) had been reported from the middle reaches of the tributary River Worth. Mr A Rushworth of Keighley remembers seeing them between Ponden Mill and Oakworth in the River Worth in the late 1950s, and EA staff have also caught them in recent years in the Worth below Ponden Reservoir, at Providence Lane in Haworth and at Hermit Hole above Keighley. Large numbers have been found at these sites, the fish being found in the mud beneath the roots of trees. Brook Lampreys were also seen in 2008 downstream of Ingrow in Keighley.

The EA has also caught specimens in the Aire at Hanlith Bridge, Newfield Hall, Gargrave, Carleton Bridge, Cononley, Silsden Bridge and Crossflatts and records them as being in Broughton Beck and the Eller Beck, whilst a further recent record of them in Eshton Beck is provided by British Waterways' staff. An old card in Cliffe Castle Museum, Keighley, mentions a specimen from Cullingworth, presumably from Harden Beck, or a tributary thereof.

Common Sturgeon *Acipenser sturio*. Only thirteen Sturgeon were seen or caught in Britain during the 20th Century and only three of these occasions were in England (Handford, 2004). The only known record of a Sturgeon in the River Aire occurred at Airmin on 24 July 1855, when a 7ft (213.36 cm) specimen was shot in the river and sold in Goole at 6d. per pound (Anon, 1855).

el *Anguilla anguilla*. There is no doubt that Eels were historically present in the Aire in ırge numbers, as would have been the case with most, if not all, of the Yorkshire rivers. lthough there are not many detailed references to fish species in the Aire, those that ıere are prior to the 1850s mention Eels. Eels appear to have ascended the river at least as ır as Keighley, and probably beyond. As Eels were in the river long after obstructions had revented Salmon migration in the 18th century, and continued to be there until gross ollution commenced, it would appear that pollution was the cause of the demise of Eels in ıe Aire.

he Reverend Miles Gale's list of fish at Keighley around 1700 (Gale, 1815) includes Eel, as oes the list in Gent (1733). Keighley (1858) lists the fish which were no longer in the river t Keighley and, as he does not mention Eel, it might be construed that it was still there.

number of references in the *Pollution Commission Report* (1867) suggests that they had een prevented from ascending the river by the onset of gross pollution. The miller on the outh side of the dam at Castleford remarked that the coarse fishing was good up to 1850 nd that his brother had caught lots of Eels there with a leap (net) (op.cit., para.15698 on). Villiam Ferrand's statement said that the Aire at Bingley had contained vast quantities of sh, including Eel, during the period he had fished there from 1817 to 1826 (op.cit., para. 481 on).

ohn Holmes, the gamekeeper at Esholt Hall from 1839 to 1867, listed Eel as one of the pecies which had been in the river at Esholt, but "Eels and everything" were killed by ollution in the summer of 1865, right down to the Stansfield Estate at Esholt. As pollution ontinued to increase, it is probable that Eels did disappear from the Aire during the 1850s nd 1860s. There are no further specific records of them being caught by anglers or by the uthorities after that time, other than a 37 inch specimen being found in a pipe at Tong ark, Baildon, around 1920 (Jackson, 1939).

els were certainly returning to the river by the 1980s. The writer caught one in the late 980s at Eggborough, below Chapel Haddlesey. The Environment Agency also caught six els at Chapel Haddlesey in 2009. Other recent records have included the sighting of a large el below Knostrop Lock in summer 2003 and their capture by Bradford fishermen at Beal ı summer 2005. It is thought that the report of two Eels being seen in a pipe at Esholt STW ı the 1990s can be discounted, as they were probably Grass Snakes *Natrix natrix*. An mployee there once described how he'd seen an "eel" which swam across a sewage ıgoon at Esholt, and then made its way up the bank. It is likely that he had seen a ıelanistic Grass Snake.

definite sighting of an Eel was made in August 2005 when one was found in a traffic cone 'hich was retrieved from the mouth of Silsden Beck (K Sunderland & A Rushworth pers. bs.). Further investigation revealed that the Environment Agency had stocked two ributaries of the Aire, Silsden Beck and Eshton Beck with elvers around 1998 so it was not

clear whether this was an Agency stocked Eel or one which had found its own way up the Aire. However in April 2006 an Eel no more than 8 or 9 inches long was seen swimming in the River Worth in Keighley (K Sunderland & A Rushworth pers. obs.). This was followed within a couple of days by a sighting of another Eel, about a foot long, by the side of Eastburn Beck at Glusburn. This was dropped by a Heron *Ardea cinerea* and returned alive to the beck by a bystander. The size of the River Worth Eel would preclude it from being an elver stocked 8 years previously and would indicate that Eels have returned naturally to the Aire system. The EA caught an Eel at the top of Silsden Beck in 2007. Records in 2011 include a large dead Eel at Rodley NR and angling captures above Crown Point Weir, Leeds, and below Saltaire Weir.

Whether Eels will return to the Aire in anything like their former numbers is open to conjecture. In recent years the European Eel population has plummeted and the number of elvers returning from the Sargasso Sea is said to be as little as 5% of the numbers returning in the early 1980s. The reduction on the east coast of Britain has been more pronounced than that on the west coast.

In order to improve Eel populations the EA stocked the Aire at Rodley with 63,000 elvers in March 2007. Even in the early part of the 20th century William H Whitaker noted that young Eels had been introduced by local angling clubs (ACs), probably in the Keighley area (Whitaker, 1910).

Salmon *Salmo salar*. The *Pollution Commission Report* (1867) includes interviews with various witnesses who could remember the fish populations above Shipley before any pollution and before gross pollution affected the river downstream from Shipley. It is interesting to note that few of the witnesses spoke of the presence of Salmon in the river, although Salmon and smolts were recorded as still being at Keighley in 1733 (Gent, 1733). This suggests that Salmon disappeared from the reaches above Leeds during the latter half of the 18th century and that the major cause was impassable barriers and not the ever-increasing pollution in the 19th century. As late as 1867, Mr Bartholomew stated (Anon, 1867, Para. 7311) that Salmon frequently used to come over the dam at Haddlesey (the bottom weir on the Aire) and he believed that they had done so up until the previous year.

The corn miller on the south bank of the river at Castleford said that up to 1850 he had generally seen Salmon leaping at the dam there in October and November but had never seen them since (Para. 15698 on). A witness from Leeds (Pollution Commission, 1867, Para. 7736 on) stated that around 1800 the river and becks were very clear and offered excellent fishing, even in the centre of Leeds. In the town there were only scale fish but two or three miles downstream there were occasional Brown Trout and four miles downstream, opposite Temple Newsam, the river abounded with Trout and Grayling. This witness made no mention of the presence of Salmon at that time, only that he had been told that someone had speared one of more than 20lbs around 1756.

ɔhn Holmes, the gamekeeper at Esholt Hall from 1839 to 1867, declared the river above eeds at Esholt Hall (below Shipley) as having been full of fish, but that he had never heard f Salmon being there, nor of the Salmon Fishery Commissioners having been there (Anon, 867, Para.9505 on). William Ferrand regularly fished the river from 1817 to 1826 at ingley and, although noting that the river was beautiful and clear in those years and ontained vast quantities of trout, Grayling and Eel, makes no mention of Salmon (Pollution ommission, 1867, para. 5481 on).

rom the foregoing, it would appear that although some Salmon were able to reach astleford up to about 1850, they were not progressing much further up the river. lowever, the 44th Report of the Yorkshire Rivers Board (Anon, undated) states that Salmon vere seen at Allerton Bywater, just upstream of Castleford, as late as 1850. Since the ollution Commission was asking for evidence of the previous state of the river, it is highly kely that witnesses would have mentioned the presence of Salmon if the fish had been resent in the river in their lifetime. Hence the conclusion must be drawn that it was not ollution which initially led to the demise of the Salmon but the erection of the barriers to pstream movement. Mr W N Wilkinson, agent to the Aire and Calder Navigation, stated hat stopping the discharge of sewage to the river "would be the most desirable thing ossible. I do not say that it would clear the river altogether and make our Salmon come ack, but it would be a very great thing" (Pollution Commission, 1867, para 16179).

'roof of the return of Salmon took place in November 2002 when Colin Haggerty caught a 6lb specimen at Chapel Haddlesey near Eggborough. The fish was photographed and eturned to the water unharmed. A previous unverified sighting in the tidal reaches was ecorded in the *36th Annual Report* of the West Riding of Yorkshire Rivers Board (Anon, 1930). This Salmon, about two and a half feet in length and not in healthy condition, had een observed for a considerable time near Carlton Bridge, near Snaith.

'he first confirmed modern Salmon sightings in the non-tidal Aire were by EA staff nspecting film of fish attempting to ascend Knottingley Weir, taken by K Sunderland and A 'remethick in October 2007. The following month, the EA caught eight Salmon and two Sea 'rout *Salmo trutta* below Chapel Haddlesey Weir, and then a further two Salmon, a very arge Brown Trout and a Flounder *Platichthys flesus* a few days later. From this evidence the A's Fisheries Team Leader for the area thought that there were probably hundreds of almon in the lower Aire in 2007.

'he sightings in 2007 led to high expectations in 2008 but, although leaping fish were seen t Knottingley Weir, they were not in numbers approaching those of the previous year. lowever, on 27 October 2009 expectations were met when, in the space of an hour, the uthor witnessed 29 fish leaping at the weir. It was not possible to verify that all were almon, but some were definitely identified as such. Further sightings at Knottingley Weir vere made in 2010, 2011 and 2012.

In the years prior to 2007 there had been reports of Salmon having been seen in Leeds at Thwaite Mills and at Knostrop Lock Weir. Due to the difficulty in differentiating between Salmon and trout, it had not been possible to positively identify the fish, but it is highly likely that some of them were Salmon. In addition a Leeds angler, Steve Harness, caught a 5lb Salmon near the Armouries Museum in Leeds (Anon, 2006). As yet, there are no confirmed reports of Salmon above Leeds and no juvenile Salmon have been found in the Aire or its tributaries.

Brown Trout *Salmo trutta*. This is the dominant fish in the higher reaches of the river from Malham to Gargrave where there are also healthy populations of Minnow and Bullhead. As water quality below Skipton has improved, it is perhaps surprising that trout numbers have not increased as would be expected. A number of the becks have weirs at, or near, their confluence with the main river and this may restrict the spawning grounds for trout. Tributaries which are currently cut off, or partially cut off, from the main river in this way include Broughton Beck, Eller Beck, Cononley Beck and Eshton Beck.

Prior to the mid 19th century, Trout were found all the way down the river to Leeds. William Ferrand observed that the river at Bingley contained vast quantities of trout in the 1820s, and a member of the Busfeild family remarked on the great quantities of trout there at that time. In 1800 the river at Temple Newsam abounded with trout but the trout was said to be an occasional fish two or three miles upstream of Leeds.

After the 1850s, Trout was still the main fish above Skipton but numbers declined from Skipton to Shipley. Trout was still there but coarse fish became the dominant species and the number of Trout was very restricted downstream of the confluence with the River Worth at Keighley. There are conflicting reports of the Trout population at Bingley. Mr Laycock in his evidence to the Pollution Commission in 1866 said that he'd been told that the river there was almost lifting with Trout, whereas a member of the Ferrand family said in the 1870s that pollution had increased over the previous twenty years and the joy of fishing ceased. By the 1890s, when Gray was commenting on the fish populations, there was little mention of Trout below Keighley. Above Keighley, huge stocking took place, Gray remarking on 8,000 Loch Leven trout being introduced in 1891 and 18,000 in 1893, and that this stocking was taking place for a number of years. It is thought that the stocking took place above Carleton, a mainly trout fishery, rather than below where coarse fish predominated.

Trout are now very common in the reaches from the Skipton area down to Kirkstall and even just below Leeds on suitable stretches, tending to dominate where the river is fast-moving and relatively pollution-free. They are increasingly seen at Saltaire, Esholt and Apperley Bridge. The fish, which are nearly all wild trout as opposed to stocked fish, grow to a very large size (up to 8 lb).

nvironment Agency personnel think that the trout in Leeds have travelled downstream, resumably in search of feeding opportunities, and become trapped below the weirs. Every utumn, trout can be seen leaping at the weirs at Crown Point, Knostrop Lock, Newlay ridge, Rodley, Saltaire and Hirst Mill.It is thought that they get over the lower weirs such s Shipley and Bingley.

ea Trout *Salmo trutta*. The lack of references to Sea Trout in the Aire in historical ocuments is something of a mystery. It may be that there was no distinction made etween Brown Trout and Sea Trout. On the other hand, it may be that the references ıade to Smelt may be to Sea Trout. Smelt was an old Yorkshire word for a smolt (juvenile almon or trout) but it is possible that it also encompassed adult Sea Trout. It is unlikely ıat Sea Trout was absent from the Aire in the days when Salmon regularly ran the river.

he first record of an Aire Sea Trout in modern times occurred when the Environment Agency caught two in the tidal stretch below Chapel Haddlesey Weir in November 2007. There have also been unconfirmed reports of Sea Trout in the Calder.

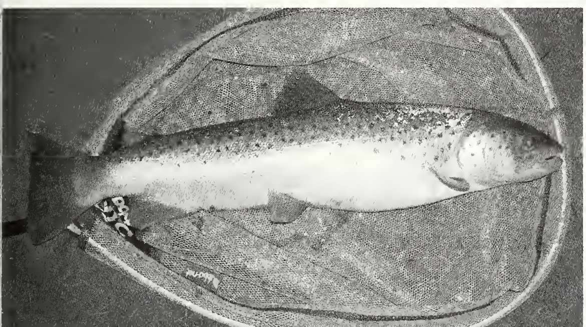


Figure 1. The first sea trout caught in the non-tidal section of the River Aire. *K.Sunderland*

The first record of a Sea Trout in the non-tidal Aire, documented by the photograph in Fig.1, took place on 24 January 2010 when Bingley angler Carl Chadwick caught a 23inch specimen in Roberts Park, Saltaire.

ainbow Trout *Oncorhynchus mykiss*. This trout has been in the River Aire for many years ut never in significant numbers. Whitaker (1910) stated that Rainbow Trout were ccasionally captured in the Aire, and this is still the case. Whitaker described them as eing introduced by angling clubs, whereas now their presence is usually attributed to scapes from fish farms and stocked lakes.

melt *Osmerus eperlanus*. Clarke and Roebuck (1881) mentioned that this fish was common ı the Humber Estuary and abounded in the Ouse up to Naburn Lock. Given recent nprovements in water quality, it is to be expected that Smelt will return to the Aire up to he tidal limit at Chapel Haddlesey. Smelt is a separate species and should not be confused vith Salmon smolts which used to be referred to locally as smelts.

s yet, there are no known records of Smelt in the River Aire. However, a young one was aught in summer 2009 in the EA tidal ponds at Airmyn. Hence there may well be a pawning population of this fish in the lower Aire.

Grayling *Thymallus thymallus*. Grayling populations have increased on a national basis in recent years as water quality has improved. The Aire has been no exception to this trend and Grayling have been found to be spreading down the river. As a fish that requires a high water quality, it suffered badly from pollution and was eventually only found in the Aire above Skipton. Gray (1891) noted that the stretch from Gargrave to Carleton, near Skipton, held a considerable number of Grayling and in 1894 the stretch from Eastburn Beck to Keighley was described as including the occasional Grayling.

In recent years the Grayling has been expanding its range downstream from the Skipton area and, since the year 2000, has been caught regularly by anglers in the Kildwick to Steeton stretch of the river. In the winter of 2009 to 2010, the Grayling population in this area had expanded to such an extent that it and Brown Trout were making up 100% of the catches in Keighley Angling Club matches.

Grayling have continued to spread down the river and since 2004 have been caught on a regular basis in the River Worth between its confluence with the Aire and the bottom weir near Aireworth Road. The Environment Agency caught one below Crossflatts Weir above Bingley in 2004 and the fish is now thriving much further downstream. Some of the spread is undoubtedly due to EA stocking in August 2006, when 1000 fish were introduced below Hirst Mill Weir, Saltaire, and a further 1000 in Myrtle Park, Bingley. However, since some of the angler-caught fish are considerably larger than these introductions it may be that much of the downstream expansion has been of natural fish populations. Increasing numbers of Grayling are now being caught by anglers at Apperley Bridge and occasional ones as far downstream as the centre of Leeds.

Oumer (a former name for Grayling from "ombre", the French word for a shadow) were included in the Reverend Miles Gale's list of fish at Keighley around 1700 (op.cit.), but by 1858 Keighley stated that there were now "neither oumers nor gralings" there.

Historically Grayling were present much further downstream. William Ferrand (op.cit.) included them as being one of the species which were at Bingley in vast quantities during the period from 1817 to 1826, but it is noticeable that John Holmes did not mention them as being at Esholt when he was gamekeeper there from 1839 on. This may have been due to the deteriorating water quality below Shipley. Another witness quoted in the *Pollution Commission Report* (1867, para. 7736) stated that the Aire about four miles downstream of Leeds opposite Temple Newsam abounded with trout and Grayling around 1800.

Pike *Esox lucius*. Gent's 1773 list of fish in the Aire at Keighley included Pike, although he said that it had first arrived in the river when Mr Tempest's fish pond at Broughton had broken into the river. Gale's list of 1690 did not mention Pike. A report in *The Naturalist* (Anon, 1937) mentioned that a large Pike weighing 11.75lbs had been caught in the Aire near Skipton on 20 October 1936.

The Environment Agency's fish surveys for 2004 and 2005 recorded good numbers of Pike in the upper section of the river from Carleton Bridge down to Crossflatts, and at the lower end of the river from Castleford down to Chapel Haddlesey. They did not record any in the long stretch in between, although Pike has been seen from Bingley down to Apperley Bridge on a regular basis. Large numbers of Pike are also known to be present in the tidal Aire below Chapel Haddlesey Weir.

Roach *Rutilus rutilus*. This fish continues to be found below Bingley but mainly in the slower stretches of river, particularly above weirs. Trout, Chub and latterly Grayling tend to be more common in the faster stretches. There are good populations of Roach above Hirst Mill Weir at Saltaire, at Apperley Bridge and at Kirkstall Abbey. The numbers greatly increase from central Leeds downstream, particularly at Castleford, Knottingley and Beal. Recent fishing matches at Beal have produced some outstanding catches of Roach.

One of the main questions on the Aire since the 1980s has been the causes of the disappearance of Roach from Skipton down to Bingley. Older coarse anglers look back to the 1950s and 1960s when there were abundant populations of Roach

The Roach were not present in the Keighley area in 1690 when the Reverend Miles Gale produced his list of fish. Nor were they there when his list was amended in 1733 by Thomas Gent. This is unlikely to be an oversight as Gent corrected the previous list by including the additional presence of Bullhead, Minnow and Three-spined Stickleback, but still did not mention Roach.

The situation had changed dramatically by the mid 19th century and there was said to be an abundance of Roach in the Keighley area. Keighley (1858) suggested that this fish had got into the river via the canal when a gentleman's pond had burst. Since Roach benefits from mild pollution it is highly likely that it did well up to the late 20th century. As Grayling had disappeared at the same time, this would indicate water quality problems. With the alleviation of these in the late 20th century, the Roach has disappeared and the Grayling begun to return.

In 1891, Johnnie Gray mentions catches of more than 20lbs of Roach between Carleton and Kildwick (Bunting *et al.*, 1974). Three anglers, on two successive Saturday half days, killed over a hundredweight (112lbs) of nothing but Roach at Bradley near Skipton. By the 1850s the river below Shipley was suffering from gross pollution and after that time, fishing catches between Shipley and Skipton are invariably noted as including Roach. The number of Roach above Keighley is greatly diminished in recent years, despite the introduction of almost 30,000 into the Keighley section of the river from 1975 to 1980. Other than a single fish at Cononley in 2005 they have not been found in recent EA surveys of that part of the river.

Surprisingly, there are records of Roach being present in the grossly polluted stretch of river below Esholt during the first half of the 20th century. The *Annual Report* of the Yorkshire Fishery District (Anon, 1938a) records that anglers were catching good quality Roach below Castleford Weir, while a later *Report* (Anon, 1940) mentions that fish (probably Roach) were being netted below Armley Weir. The West Riding of Yorkshire Rivers Board *43rd Report* (Anon, 1938b) mentions that coarse fish had been seen in the Aire near Knottingley in August 1937, the third year in a row that this had happened. On all occasions the sightings had taken place when the river was low and clear after a fairly long spell of dry weather.

Rudd *Scardinius erythrophthalmus*. One was caught by the Environment Agency in the tidal Aire below Chapel Haddlesey Weir in 2009. No other catches have been brought to the author's attention.

Dace *Leuciscus leuciscus*. Dace is found in the Aire at various locations from Carleton Bridge downstream to Castleford. They are numerous from Dowley Gap to Saltaire, at Apperley Bridge, Kirkstall, central Leeds, and Thwaite Mills.

Chub *Leuciscus cephalus*. Very much a common fish of the River Aire and in evidence all the way from Skipton to below Castleford. Chub is well suited to the river and no doubt takes advantage of the food source provided by shoals of Minnows in the middle and higher reaches. Chub was omitted from the Reverend Miles Gale's list of fish at Keighley in 1690 but was included in Thomas Gent's listing in 1733, so it is likely that Gales's omission was due to an oversight. John Holmes, gamekeeper at Esholt, mentions it there in the 1840s before the era of gross pollution. Further evidence of its abundance at Esholt at that time comes from Henry Whitaker's diary of 4 June 1842 (Anon, 1885), where he recorded that despite a thin film of gas-tar on the surface of the river, great shoals of Chub were still to be seen. Although Chub, as all other fish, disappeared from the Esholt area after pollution took its toll from 1850 on, it continued to thrive from Shipley up to Skipton and was mentioned in most lists of fish for that area in the late 19th century onwards.

Although its numbers seem much diminished in recent years, occasional very large Chub are still present in the river between Cononley and Steeton.

Minnow *Phoxinus phoxinus*. This is the most numerous fish of the River Aire, particularly above Shipley. Although still present in their millions, numbers seem to have declined somewhat. It is still regarded by anglers as a pest anywhere from Gargrave to Leeds. When the Aire in the region of Cononley still suffered from mild pollution in the 1950s and 1960s, the Minnows were a sight to behold. Vast shoals swimming alongside the bank were highly visible. In the late spring and early summer, minnows still congregate in huge numbers at certain spots including Saltaire, the shallows below the Dowley Gap Aqueduct (below Bingley) and in the mouth of Eastburn Beck. Minnows were also to be seen in the bottom half mile or so of the Bradford Beck in the years following 2000 but they then disappeared

as the trout population increased. The Bradford Beck suffered a very serious pollution incident in early May 2009 which wiped out all the fish below Bradford. The EA retrieved 1300 dead trout from the Beck following this incident. Within three months, large numbers of Minnows had reappeared in the lower Beck around Shipley Station.

Another notable occurrence took place at Saltaire Weir during exceptionally warm weather around the end of June 2009. Minnows were seen to be ascending the weir over a number of days and between 280 and 350 per hour were counted successfully completing the ascent. Huge numbers of Minnows assembled below the weir on the left bank side and the more upstream fish leaped on to the weir before heading to the right to form a foot-wide line of fish. They then swam up the weir, backs out of the water, making numerous stops to rest. The event continued for hour after hour for almost a week. Similar displays were seen over the following two years during periods of hot weather. In 2011, large numbers of Minnows were seen ascending the weir as late as 30th September (pers. obs). Minnows have also been seen making unsuccessful attempts to leap the weirs at Shipley, Bingley and Crossflatts, as well as on Morton Beck.

Environment Agency records for 2005 and 2006 show that Minnow was present at all locations surveyed between Carleton Bridge down to Thwaite Mills.

Tench *Tinca tinca*. This is not a fish which is usually associated with the River Aire but the EA has caught three at Castleford. Angling clubs have introduced Tench to the river from time to time, but without any appreciable success.

Gudgeon *Gobio gobio*. Gudgeon was included in the lists of fish at Keighley in both 1690 and 1733. It is now present all along the river downstream of Skipton. It is definitely one of the species which has returned naturally to Apperley Bridge and good-sized specimens are caught there.

Shilcock (1988) described Gudgeon as being present below Skipton, at Crossflatts, Knostrop and very common below Skelton Grange Power Station Weir. The fish surveys for 2004 and 2005 showed Castleford as having the largest numbers.

Barbel *Barbus barbus*. Barbel has been a longstanding source of controversy amongst anglers on the River Aire. The vast majority of anglers wanted Barbel to be (re)introduced whilst a very small minority resisted this measure. The fish is found in all the other West and North Yorkshire rivers but there is no record of it being historically present in the River Aire.

The Barbel is a fish which is highly prized by coarse fish anglers due to the size it can reach and its fighting qualities. A move was made to introduce it to the Aire in the vicinity of Bingley in 1980 but permission to do so was refused by Yorkshire Water Authority's Fisheries Officer. This was later amended to permission to introduce 300 male fish below

Bingley. The permit was not acted upon due to the problems of acquiring fish of one sex. A further attempt was made to introduce Barbel in 1999 but this time the Environment Agency decided that an introduction could not be permitted as Barbel was not native to the River Aire.

It would appear that some unofficial stocking of Barbel had taken place over the years as it started to be caught in small numbers. In March 1997 an angler fishing at Saltaire hooked and lost an estimated 6lb Barbel. This was only the third to be seen in the Aire for 40 years (Anon, 1997). Increasing numbers of Barbel have been caught at Saltaire since that time. The Environment Agency caught a couple in 2004 below Crossflatts Weir and also found them at Saltaire. There have also been reports of them being caught below Armley Mills Weir in Leeds. The probability is that these fish had been introduced illegally and that improved water quality meant that they were able to breed successfully. Barbel have also been reported by anglers from below Knottingley.

The first officially sanctioned stocking of Barbel took place on 26 October 2007 when Saltaire AC, Bingley AC and Keighley AC put a total of 700 fish into their local waters. In the following November the Barbel Society provided Keighley AC with a further 180 for stocking below Kildwick. Subsequent to the initial stocking in October 2007, the EA introduced almost 5,000 smaller Barbel at Apperley Bridge, Rodley, Kirkstall, Armley and Thwaite Mills, and further boosted the stocks upstream of Saltaire in 2009 with 1,500 fish. Annual EA stocking continues at c.3,000 per year at various locations between Kildwick Bridge and Thwaite Mills. When the stocking scheme is expected to end in 2014 a total of over 21,000 Barbel will have been officially stocked into the river between Thwaite Mills and Kildwick Bridge.

Bleak *Alburnus alburnus*. There is no mention of Bleak in old River Aire records. However, it now appears to be entering the river system from the River Ouse, and angler C Haggerty mentioned large shoals of Bleak in the tidal section below Chapel Haddlesey in 2004 and the Environment Agency captured one there in the same year. In 2005 there were reports of them further upstream, an angler catching one at Beal and the Environment Agency one at Castleford. This was followed by a further nine electro-fished at Castleford in 2009.

Common Bream *Abramis brama*. There are no historic records of Bream in the River Aire. However, there is no doubt that it is present now, but on a somewhat patchy basis. Shoals are said to be in the river above Stockbridge, Keighley, and have been seen opposite Marston's Nature Reserve below Shipley and between Crown Point and Knostrop Lock in Leeds. All these stretches are slow-flowing and it is probable that there are large Bream in such areas all along the lower stretches. The EA caught two in the tidal stretch below Chapel Haddlesey in 2005.

Silver Bream *Abramis bjoerkna*. Records of Silver Bream are very limited as most anglers do not distinguish between this fish and small Common Bream. However, EA has caught it in the tidal Aire at Chapel Haddlesey on a couple of occasions over the last few years.

Common Carp *Cyprinus carpio*. There appear to be a few small populations of Carp in the River Aire. The writer has seen one at Cottingley Bridge and another above the Dark Arches in Leeds, and has had reports of Carp around Crown Point and in the Knottingley area. There is no mention of Carp in the Aire in historical records.

Perch *Perca fluviatilis*. Other than in the parts which suffered from gross pollution at the time, Perch would appear to have been present all along the river downstream of Skipton, albeit in small numbers. The early 18th century records show them at Keighley. A report in the *Bradford Telegraph* around 1885 recorded that Mr Sutcliffe Rhodes of the Bradford Eagle AC, had caught three Perch. Writing in the early years of the 20th century, Whitaker (1910) regretted that the Perch was gradually disappearing from the Aire.

More recently, Perch has been seen at Dowley Gap and is regularly caught in large numbers in the Leeds area. The Environment Agency's fish surveys for 2004 and 2005 did not reveal any Perch above Leeds. However, from Leeds downstream their numbers continued to increase and large numbers were recorded at Castleford and Chapel Haddlesey.

Ruffe *Gymnocephalus cernuus*. Gent (1733) mentions Ruffe in his list of fish in the Aire near Keighley in 1690 but Keighley (1858) said it was no longer in the Aire. However, Whitaker (1910) stated that the Ruffe was the commonest quarry of the worm fisher in the deeper parts of the Aire. Clarke and Roebuck (1881) stated that Ruffe was previously found in the Lower Aire but had been exterminated by pollution. Ruffe is still present in the river around Keighley but is only rarely caught.

Stone Loach *Barbatula barbatula*. Found in habitats similar to those frequented by Minnow. The 2007 survey by the EA found Stone Loach at all locations surveyed between Carleton Bridge and Thwaite Mills.

Bullhead *Cottus gobio*. Found at various locations all the way down the river from Hanlith Hall near Malham to Thwaite Mills. There are also large numbers in the River Worth and its tributaries. The likelihood is that it is also present in the becks which flow into the Aire.

Three-spined Stickleback *Gasterosteus aculeatus*. This fish would appear to have always been a resident of the Aire, being mentioned in almost all historic records. Even in the days of gross pollution downstream of Shipley, the river was described as containing Sticklebacks.

Flounder *Platichthys flesus*. Flounder is found in the tidal Aire. C Haggerty caught one below Chapel Haddlesey Weir in May 2004 and the EA caught another there in November

2007. This fish would probably have been found as far upstream as Knottingley prior to the tidal limit being moved downstream to Chapel Haddlesey in the 18th century.

Burbot *Lota lota*. Burbot is believed to be extinct in Britain, the last sighting having been at Cambridge in 1969. There are no known records of it in the Aire but it was certainly present in the sluggish lower reaches of other Yorkshire rivers in the 19th and 20th centuries. Clarke and Roebuck (1881) made mention of Burbot being relatively common in the Hull, Lower Derwent, Whiske, Foss and the Ouse below Naburn.

Crayfish

American (Signal) Crayfish *Pacifastacus leniusculus*. Following the finding of the claw of a Signal Crayfish by EA employees at Silsden Bridge in 2004, plus reports of its presence by anglers, EA carried out trapping there in June 2005. Three traps were set on a Friday night and, when they were opened the next day, were found to contain between 15 and 20 specimens. This was the first official confirmation that this species was living in the River Aire (Anon, 2005). EA carried out further trapping elsewhere on the river but they did not find further crayfish. More recently, Signal Crayfish has been found in the Eller Beck near Skipton Castle and there have been possible sightings in the River Worth, Eastburn Beck and at Bingley.

One of the theories as to how the Signal Crayfish arrived in the Aire was that anglers might have been using them as bait but it is more likely that they were transferred from the River Wharfe by a member of the public. Signal Crayfish have been abundant in the upper Wharfe for a number of years.

Signal Crayfish, which is said to compete for habitat with the native White-clawed Crayfish *Austropotamobius pallipes*, carries a plague to which the latter has no resistance. It also eats the eggs of fish. It can colonise a river downstream at about a kilometre a year. Reports from Silsden suggest that there are hundreds of Signal Crayfish there.

White-clawed Crayfish *Austropotamobius pallipes*. This species still inhabits the upper Aire above Gargrave and also Eshton Beck, Harden Beck, Wyke Beck and Meanwood Beck. A report in *The Naturalist* (Anon, 1937) stated that Crayfish had been seen in the upper reaches of the Aire and also in the Otterburn Beck. It would appear that it disappeared from other areas of the catchment due to pollution.

Keighley (1858) stated that some Crayfish were present in the Keighley area and had arrived there after having been introduced into a small brook near Steeton. Crayfish is included in the list of species which William Ferrand described in the Bingley area of the river when he knew it from 1817 to 1826 (*Pollution Commission Report*, 1867). "There are, or were until a recent period, some of the best specimens of the common crayfish in England in the Aire, in the immediate vicinity of Saltaire and Bingley." (Anon, 1884).

Future Progress

Most fish species in the River Aire are expected to continue to benefit from increasing water quality, removal of barriers to movement and other habitat improvements. The future looks particularly bright for migratory fish such as Salmon, Sea Trout, Eel, Sea and River Lamprey and non-migratory fish such as Grayling and Barbel. Other coarse fish should also do well in the slower reaches of the river. Benefits to fish stocks and associated wildlife should follow from the implementation of the Water Framework Directive. Anglers and conservationists in the Aire Valley should be confident that the improvement to the River Aire is set to continue.

The author

The author is a founder member of the Aire Rivers Trust and a member of the Aire Action Leeds Planning and Policy Committee, where he has pursued the improvement of fish passage on the Aire for a number of years.

References

Anon (1855) *Goole & Marshland Gazette* 24th July.

Anon (1884a) *Angling in Yorkshire*, 5th July

Anon (1884b) *Angling in Yorkshire*, 19th July.

Anon (1885) *Angling in Yorkshire*, 21st February.

Anon (1912) *The Bradford Scientific Journal*, 3, 1910-1912.

Anon (1937) The Yorkshire Naturalists' Union Seventy-fifth Annual Report, for 1936. *The Naturalist*, p17.

Anon (1938a) *72nd annual report*. Yorkshire Fishery District.

Anon (1938b) *43rd report*. West Riding of Yorkshire Rivers Board.

Anon (1940) *74th annual report*. Yorkshire Fishery District.

Anon (1997) Regular fisherman's irregular story. *Telegraph & Argus*, 12th March.

Anon (2005) Killer crayfish are found. *Telegraph & Argus*, 21st June.

Anon (2006) *Coarse Fishing* March 2006

Anon (2007a) *Pontefract and Castleford Express*, 25th January.

Anon (2007b) *Telegraph and Argus*, 27th July.

Anon (2008) *Goole and Thorne Courier*, 11th March.

Anon (2009) *Telegraph and Argus,* 7th August.

Anon (c1930) *36th annual report*. West Riding of Yorkshire Rivers Board.

Anon (undated) *44th and final report* p7. West Riding of Yorkshire Rivers Board.

Bunting, W., Hanson, M., Howes C. A., and Kitchen, A., (1974) The History of fish in the Doncaster District. *The Naturalist* 98.

Clarke W.E. and Roebuck, W.D. (1881) *A Handbook of the Vertebrate Fauna of Yorkshire*, pp 103, 104, 119.

Firth C.J. (1997) *Sturgeon in the River Don. Domesday to the dawn of the new millennium,* Appendix 7. Environment Agency.

Gale, Rvd M. (1815) *The Gentleman's Magazine.*

Gent, T. (1733) *History of the Loyal Town of Ripon*, pp34-38.

Gray, J. (1891) *Through Airedale from Goole to Malham.*

Handford, R. (2004) *Freshwater Fishes in Britain* p 50.

Howes, C.A. (2008) The Harbour Porpoise in inland water bodies in Yorkshire, *The Naturalist*, pp116-117.
Jackson, S. (1939) *The Naturalist*, p210.
Keighley, W. (1858) *Keighley Past and Present*, pp 51-53.
Miall, L. C. (1890) *Natural History of the Aire. Handbook for Leeds and Airedale* pp22-24. British Association for the Advancement of Science, Leeds.
Ogden, J. (1972) *Yorkshire's River of Industry*, p51.
Pollution Commission (1867) The best means of preventing the pollution of rivers (Aire and Calder). *Pollution Commission 3rd Report* 1 and 2.
Shilcock, D.J. (1974) *Symposium-Rivers Aire and Calder*, Yorkshire Water Authority, p39.
Shillcock, D.J. (1988) *Water Management in the Aire Catchment,* p43. Yorkshire Water.
Whitaker, W.H. (1910) The Fishes of Upper Airedale, *Bradford Scientific Journal* 2:13-19.

Yorkshire Ichneumons: Part 1

W.A.Ely 9 Clifton Lane, Rotherham, South Yorkshire S65 2AA

Introduction

The study of Yorkshire's ichneumons in recent years has resulted in many additions to the county list and many more for each vice-county. These are included in the list maintained on the YNU website but most of the additions have not been formally reported in *The Naturalist.* Several have been published in the pages of the *Sorby Record* or other publications. The fact that such references are quoted here as a record of occurrence in a particular vice-county does not necessarily mean that they refer to the earliest record, just the earliest publication. The specimens on which many of the earlier references are based have not been found and checked, so these references are included as unconfirmed in order to acknowledge the contributions of previous workers. If there is a later confirmed specimen then that is reported here as the first accepted vice-county record. Some of the unconfirmed records are due to taxonomic changes, some quite recently. The specimens on which these published reports are based may still exist and they may be located and verified in the future, as some have already been traced and confirmed. In some cases it will be apparent that the earliest record is not shown as being 'new to Yorkshire'. There is a difference between the first and the earliest Yorkshire records and it is quite common for a species to be published as 'new to Yorkshire/new to VC61, etc.' only for one or more earlier specimens to be discovered subsequently. I have identified or checked all the new records reported here unless otherwise specified.

Subfamily Pimplinae, Tribe Ephialtini

The spider parasitoids from *Dreisbachia* onwards have long been considered as a separate tribe, the Polyspinctini, which forms a natural (i.e. monophyletic) group. However, the rest of the Ephialtini, which also contains spider parasitoids, is paraphyletic and not a natural

group. It is generally considered better to reunite these tribes until a more satisfactory subdivision can be devised.

Some reviews of regional and local fauna have included ephialtine ichneumons. Bairstow *et al.* (1882) provides our earliest list and Roebuck (1907) includes a Yorkshire list in the 'Victorian County History' series, largely based on earlier publications plus specimens sent to Claude Morley for identification. Walsh & Rimington (1956) report on them in a comprehensive review from the Scarborough area. I have not located many of the specimens on which the records in these three publications are based and they are considered to be unconfirmed. Ely (1992; 2000) reviews the records from South Yorkshire (including the parts of VC56 and VC57 transferred to the modern county) at the end of the 20th century and Coldwell (1999) includes them in a list of the insects of Barnsley. Mayhew *et al.* (2009) report on the results of a malaise-trapping project around York at the start of the 21st century. There are many reports from field meetings around the county and even site reviews (Skidmore *et al.,* 1987; Ely, 1987b; Skidmore, 2006).

Key: † = new county record   * = new vice-county record

Ephialtes manifestator (Linnaeus, 1758)

Reported from VC61 by Shaw (2006 p219) and Mayhew *et al.* (2009 p14) and from VC63 by Skidmore (2006 p148).

Dolichomitus agnoscendus (Roman, 1939)

Reported from VC61 by Shaw (2006 p219) and Mayhew *et al.* (2009 p14) and from VC63 by Ely (2000 p44).

Dolichomitus mesocentrus (Gravenhorst, 1829)

Reported from VC61 by Hincks (1953 p135).

*VC63: Hatfield Moor 13.5.1992 P.Skidmore.

Dolichomitus populneus (Ratzeburg, 1848)

†VC63: Wadworth Wood ex *Saperda populnea* em. 5.6.1985 P.Skidmore.

Dolichomitus pterelas (Say, 1829)

Reported from VC64 by Shaw (2006 p219) and Mayhew *et al.* (2009 p14).

Dolichomitus terebrans (Ratzeburg, 1844)

Reported from VC64 by Mayhew *et al.* (2009 p14).

Dolichomitus tuberculatus (Geoffroy in Fourcroy, 1785)

Unconfirmed report from VC64 by Fordham (1924 p309); reported from VC61 by Hincks (1955) and Mayhew *et al.* (2009 p14) and from VC63 by Ely (1992 p8) and Coldwell (1999 p61).

*VC62: Ellerburn 29.9.1979 J.H.Flint.

*VC64: Bishop Wood 31.8.1988 J.H. + H.E.Flint.

Townesia tenuiventris (Holmgren, 1860)

Reported from VC61 by Mayhew *et al.* (2009 p16).

*VC63: Crimsworth Dene 27.7.2011 W.A.Ely.

*VC64: Leeds 6.8.1950 unknown.

Liotryphon caudatus (Ratzeburg, 1848)

Reported from VC63 by Ely (2000 p44).

Liotryphon crassisetus (Thomson, 1877)

Unconfirmed reports from VC61 and VC64 by Mayhew *et al.* (2009 p14); reported from VC63 by Ely (1992 p8) and from VC64 by Godfrey & Whitehead (2000) (det. M.R.Shaw).

*VC61: Buttercrambe Woods 10.6.1944 J.H.Elliott.

Liotryphon punctulatus (Ratzeburg, 1848)

†VC63: Drop Clough 6.1986 D.Maude.

Exeristes ruficollis (Gravenhorst, 1829)

Reported from VC61 by Mayhew *et al.* (2009 p14).

Fredegunda diluta (Ratzeburg, 1852)

Reported from VC61 by Hincks (1951 p28, 1953 p136) and Fitton *et al.* (1988 p45) and from VC63 by Skidmore *et al.* (1987 p127), Ely (1992 p8) and Skidmore (2006 p148).

Endromopoda arundinator (Fabricius, 1804)

There is an unconfirmed report from VC63 by Carr (1914 p94).

Endromopoda detrita (Holmgren, 1860)

Fitton *et al.* (loc. cit.) split the previous concept of this species into two, including the following species. The report from VC63 by Carr (1914 p94) is unconfirmed; reported from VC61 by Morley (1908 p89), Hincks (1953 p136) and Mayhew *et al.* (2009 p14), from VC63 by Ely (1992 p8; 2000 p44) and Skidmore (2006 p148) and from VC64 by Ely (1987b p23) and Mayhew *et al* (2009 p14).

*VC62: Mulgrave Woods 3.8.1936 H.Britten.

*VC65: Feldom 18.8.1990 W.A.Ely.

Endromopoda nigricoxis (Ulbricht, 1910)

Reported from VC61 by Hincks (1953 p136) [as *E. detrita*] and Mayhew *et al.* (2009 p14) and from VC63 by Hammett & Hammett (1985 p10) [as *E. detrita*] and Ely (1992 p8).

*VC62: Malton Road, York 7.7.1945 J.H.Elliott.

*VC64: Camblesforth golf course 27.7.1987 W.A.Ely.

*VC65: Birk Gill 7.7.1984 W.A.Ely.

Endromopoda nitida (Brauns, 1898)

†VC61: Fulford Ings 1.8.2011 R.Crossley.

Endromopoda phragmitidis (Perkins, 1957)

Reported from VC63 by Ely (2000 p44) and Skidmore (2006 p148) and from VC64 by Ely (1987b p24).

*VC61: Spurn Point NR 4.7.2002 P.Kendall.

Scambus brevicornis (Gravenhorst, 1829)

Unconfirmed reports from VC61 by Morley (1908 p75) and from VC64 by Bairstow *et al.* (1882 p108); reported from VC61 by Fordham (1926 p117) and Mayhew *et al.* (2009 p15), from VC63 by Hincks & Dibb (1940 p175), Ely (1992 p9) and Coldwell (1999 p61) and from VC64 by Ely (1987b p24).

*VC62: Malton Road, York 3.6.1944 J.H.Elliott.

Scambus buolianae (Hartig, 1838)

Reported from VC61 by Hincks (1951) and from VC63 by Ely (1992 p9; 2000c p45), Coldwell (1999 p61) and Bateson (2002 p43).

*VC62: Keld Head 15.5.1985 G.King.

*VC64: Shipley Glen 2.8.1941 J.Wood.

Scambus calobatus (Gravenhorst, 1829)

Unconfirmed reports from VC64 by Wilson (1881 p153), Bairstow *et al.* (1882 p108), Roebuck (1907 p215) and Morley (1908 p84); reported from VC61 by Hincks (1953 p135) and from VC63 by Ely (1992 p9; 2000 p45).

Scambus elegans (Woldstedt, 1877)

†VC61: Skipwith Common 17.8.2011 R.Crossley.

*VC64: Ellington Banks 17.8.2012 C.H.Fletcher.

Scambus eucosmidarum (Perkins, 1957)

Reported from VC63 by Ely (1992 p9; 2000 p45).

Scambus foliae (Cushman, 1938)

Reported from VC61 by Shaw (2006 p219) and Mayhew *et al.* (2009 p15).

Scambus inanis (Schrank, 1802)

Fitton *et al* (loc. cit.) called this *Scambus annulatus.* It has been split into three species by Klaus Horstmann (Shaw, 2006) but they overlap and some specimens are not determinable. There are unconfirmed reports [mostly as *S. annulatus* (Kiss, 1924)] from VC61 by Mayhew *et al.* (2009 p15), from VC62 by Morley (1908 p86), from VC63 by Skidmore (2006 p148) and from VC64 by Ely (1987b p24); reported from VC61 by Hincks (1953b p135) and from VC63 by Ely (1992 p9) and Coldwell (1999 p61) [all as *annulatus*].

*VC62: Malton Road, York 3.5.1944 J.H.Elliott.

*VC64: Morton 29.8.1942 J.Wood

Scambus nigricans (Thomson, 1877)

Reported from VC62 by Fordham (1920 p181), from VC63 by Ely (1992 p9; 2000 p45) and from VC64 by Ely (1987b p24).

*VC61: Allerthorpe 12.8.1923 W.J.Fordham.

*VC65: Thorpe Perrow Arboretum 17.7.1982 W.A.Ely.

Scambus pomorum (Ratzeburg, 1844)

Reported from VC61 by Ely (1986a p103) and Key (1987 p221) and from VC64 by Mayhew *et al.* (2009 p16).

*VC62: Ashberry Pastures 15.6.1977 P.Skidmore.

*VC63: Marley 5.6.1948 J.Wood.

Scambus sagax (Hartig, 1838)

†VC64: Clifton Ings 26.8.1945 J.H.Elliott.

Scambus signatus (Pfeffer, 1913)

Reported from VC63 by Ely (1992 p9; 2000 p45) [as *S. annulatus* (Kiss, 1924)] and from VC64 by Ely (2012 p227).

*VC61: Allerthorpe 25.8.1952 J.H.Elliott.

*VC62: Malton Road, York 14.5.1944 J.H.Elliott.

Scambus vesicarius (Ratzeburg, 1844)

Reported from VC61 by Mayhew *et al.* (2009 p16) and from VC63 by Humberstone & Ely (1986 p12), Whiteley (1989 p97) and Ely (1992 p9).

*VC62: Snargate 2.9.2011 W.A.Ely.

*VC64: Clifton Ings 11.8.1945 J.H.Elliott.

Acropimpla didyma (Gravenhorst, 1829)

Reported from VC63 by Ely (2000 p45) and from VC64 by Ely (1987b p24).

*VC61: Allerthorpe 8.5.1920 W.J.Fordham.

Gregopimpla inquisitor (Scopoli, 1763)

Reported from VC61 by Hincks (1953 p135) and Mayhew *et al.* (2009 p15) and from VC63 by Ely (2011a p202).

*VC65: Marne Barracks 15.7.2011 C.H.Fletcher

Iseropus stercorator (Fabricius, 1793)

Unconfirmed reports from VC63 by Wilson (1881 p153) and Roebuck (1907 p215) and from VC64 by Wilson (1881 p153), Bairstow *et al.* (1882 p108), Roebuck (1907 p215) and Morley (1908 p64); reported from VC61 by Hincks (1953 p135), from VC63 by Ely (1992 p9; 2000 p45) and Skidmore (2006 p148) and from VC64 by Ely (1987b p24).

Tromatobia forsiusi (Hellén, 1915)

There is an unconfirmed report from VC63 by Skidmore (2006 p148).

Tromatobia lineatoria (Villers, 1789)

There are unconfirmed reports from VC63 by Bairstow *et al.* (1882 p108), Roebuck (1907 p215) and Morley (1908 p115); reported from VC61 by Ely (1985 p76) and Mayhew *et al.* (2009 p16), from VC62 by Hincks (1943 p122; 1944 p37) and Walsh & Rimington (1956 p277), from VC63 by Hincks & Dibb (1940 p175), Ely (1992 p10; 2000 p45) and Coldwell (1999 p61) and from VC64 by Hincks & Dibb (1940 p175) and Ely (2012 p227).

VC65: Jetties Riverside Common, Brompton Bridge 1.7.2013 W.A.Ely

Tromatobia ovivora (Boheman, 1821)

There is an unconfirmed report from VC62 by Fordham (1929 p375) and Walsh & Rimington (1956 p277); reported from VC63 by Bateson (2002 p43).

*VC64: Cawood 1977 J.Payne.

Tromatobia variabilis (Holmgren, 1856)

Reported from VC63 by Ely (1986b p14; 1992 p10).

Zaglyptus multicolor (Gravenhorst, 1829)

Reported from VC61 and VC64 by Mayhew *et al.* (2009 p16) and from VC63 by Ely (1992 p10; 2000 p45) and Coldwell (1999) p61.

Zaglyptus varipes (Gravenhorst, 1829)

Reported from VC63 by Ely (1992 p10) and Coldwell (1999 p61) and from VC64 by Ely (1987b p24).

Clistopyga incitator (Fabricius, 1793)

Reported from VC61 by Mayhew *et al.* (2009 p13), from VC62 by Walsh & Rimington (1956 p277) and Mayhew *et al.* (2009 p13), from VC63 by Hincks & Dibb (1940 p175), Ely (1992 p10) and Coldwell (1999 p61) and from VC64 by Morley (1918 p398), Anon (1919 p35), Fordham (1920 p182), Ely (1987b p24) and Mayhew *et al.* (2009 p13).

*VC65: Hutton Conyers 1.8.2011 C.H.Fletcher.

Clistopyga rufator Holmgren, 1856

†VC64: Little Ouseburn 3.7.2011 W.A.Ely.

Dreisbachia pictifrons (Thomson,1877)

*VC62: Woodside 2.9.2011 W.A.Ely.

†VC63: Anston Stones Wood 5.9.2004 W.A.Ely.

*VC65: Langton Wood 9.6.2011 W.A.Ely,M.McKerchar.

Schizopyga circulator (Panzer, 1801)
Reported from VC61 by Mayhew *et al.* (2009 p16).
*VC63: Catcliffe 25.8.2001 W.A.Ely.
*VC65: Cordilleras 18.8.1990 W.A.Ely.

Schizopyga frigida (Cresson, 1870)
Reported from VC61, VC62 and VC64 by Mayhew *et al* (2009 p16) and from VC63 by Ely (1992 p10; 2000 p45).

Schizopyga podagrica Gravenhorst, 1829
Unconfirmed report from VC62 by Key (1987 p74).

Polysphincta rufipes Gravenhorst, 1829
Reported from VC64 by Ely (2011b p215).
*VC62: Bank Top Farm, Northallerton 9.6.2011 W.A.Ely,M.McKerchar
*VC63: Pit House West, Rother Valley CP 20.8.2000 W.A.Ely

Polysphincta tuberosa Gravenhorst, 1829
Reported from VC61 by Mayhew *et al.* (2009 p15) and from VC63 by Anon (1986 p8), Whiteley (1989 p51) and Ely (1992 p10; 2000 p46).
*VC62: Over Dinsdale, Northallerton 29.6.2011 W.A.Ely.
*VC64: Piney Moor Wood 2.9.1989 W.A.Ely.
*VC65: Hutton Conyers 31.8.2011 C.H.Fletcher.

Polysphincta vexator Fitton, Shaw & Gauld, 1988
†VC62: Fen Bog 15.8.2011 R.Crossley.

Acrodactyla carinator (Aubert , 1965)
Reported from VC64 by Shaw (2006 p219) and Mayhew *et al.* (2009 p13).
*VC63: Barrow Colliery site, Barnsley em. 5.5.2013 J.D.H.Brown

Acrodactyla degener (Haliday, 1838)
Fitton *et al* (loc. cit) reported that two forms of this ichneumon occurred in the UK and listed their differences but did not formally separate them into distinct species. Klaus Horstmann has now done this, based partly on specimens in the National Museums of Scotland, but this has not yet been published. All previous records are, therefore, unconfirmed, including the reports from VC63 by Humberstone & Ely (1986 p12), Whiteley (1986 p97) and Ely (1992 p10) and from VC64 by Ely (1987a p30). The only confirmed specimens are the ones seen by Horstmann and reported from VC61 and VC64 by Mayhew *et al.* (2009 p13).
*VC62: Scawton em. 6.51997 G.Oxford (det K.Horstmann).

Acrodactyla quadrisculpta (Gravenhorst, 1820)
†VC63: Kilnhurst Ings 7.6.2000 W.A.Ely.
*VC64: Blubberhouses Moor 21.8.2011 A.R.Godfrey.
*VC65: Thwaite, Swaledale 3.7.2013 W.A.Ely.

Acrodactyla similis Horstmann, manuscript name
Reported from VC61 and VC64 [as *A. degener* (Haliday, 1838) but seen by Horstmann] by Mayhew *et al.* (2009 p13).

Megaetaira madida (Haliday, 1838)
Reported from VC61 and VC64 by Mayhew *et al.* (2009 p15) and from VC63 by Ely (1992 p10).
*VC65: Birk Gill 7.7.1984 W.A.Ely.

Sinarachna nigricornis (Holmgren, 1860)
Reported from VC64 by Ely (1991 p150).
Sinarachna pallipes (Holmgren, 1860)
Reported from VC65 by Ely (1987a p30).
Zatypota albicoxa (Walker, 1874)
Reported from VC61 and VC64 by Shaw (2006 p219) and Mayhew *et al.* (2009 p17).
Zatypota bohemani (Holmgren, 1860)
Reported from VC61 and VC64 by Mayhew *et al.* (2009 p17) and from VC63 by Ely (1992 p10).
*VC62: Garbutt's Ghyl 2.9.2011 W.A.Ely.
Zatypota discolor (Holmgren, 1860)
†VC62: May Moss 10.8.2013 W.A.Ely.
Zatypota percontatoria (Muller, 1776)
Unconfirmed report from VC61 by Anon (1919 p35) and Fordham (1919 p70); reported from VC61 by Mayhew *et al.* (2009 p17) and from VC63 by Ely (1992 p11).
*VC64: Staveley NR 3.8.2011 C.H.Fletcher.

References

Anon (1919) Yorkshire Naturalists' Union: Entomological Section Annual Meeting. *Entomologist's Monthly Magazine (3rd Series)* 5, p35.

Anon (1986) Saturday, 12th April, 1986. Roche Abbey woodlands. *Rotherham Naturalists' Society Newsletter* 1986/3, p8.

Bairstow, S.D., Roebuck, W.D. and Wilson, T. (1882) Yorkshire Hymenoptera: Third List of Species. *Yorkshire Naturalists' Union Transactions 1880*

Bateson, D. (2002) *Wildlife communities inhabiting Loversall Delph*. Yorkshire Wildlife Trust.

Carr, J.W. (1914) Ichneumonidae from Yorkshire & Lincolnshire. *The Naturalist* 39, p94.

Coldwell, J.D. (1999) Insects of the Barnsley Area. *Sorby Record Special Series* 12.

Ely, W.A. (1985) Entomology. *in* Yorkshire Naturalists' Union Excursions in 1984. Allerthorpe Common (VC61). *The Naturalist* 110, p75-6.

Ely, W.A. (1986a) Entomology. *in* Yorkshire Naturalists' Union Excursions in 1985. Cat Babbleton (VC61). *The Naturalist* 111, p103.

Ely, W.A. (1986b) Report on Zoology Section Visit to Parkgate, 13th July 1985. *Sorby Natural History Society Newsletter* 224, p13-4.

Ely, W.A. (1987a) Dipterists' Autumn Meeting in North-West Yorkshire 2nd - 6th October, 1985. *YNU Bulletin* 7, p30-1.

Ely, W.A. (1987b) The Pimplinae (Hymenoptera, Ichneumonidae) of Askham Bog. *YNU Bulletin* 8, p23-5.

Ely, W.A. (1991) Entomology. *in* Yorkshire Naturalists' Union Excursions in 1989. Bilton Banks (VC64). *The Naturalist* 116, p149-50.

Ely, W.A. (1992) The Ichneumons of South Yorkshire. 1. Pimplinae. *Sorby Record* 28, p7-13.

Ely, W.A. (2000) Ichneumons of the Sorby Area: Update on Pimplinae. *Sorby Record* p44-48.

Ely, W.A. (2011a) Hymenoptera – Parasitica. *in* Henderson, A. & Norris, A. Yorkshire Naturalist's Union Excursions in 2011. Went Ings, Sykehouse (VC63) 21 May 2011. *The Naturalist 136*, p202.

Ely, W.A. (2011b) Hymenoptera – Parasitica *in* Henderson, A. & Norris, A. Yorkshire Naturalist's Union Excursions in 2011. Gunnerside & Low Row (VC65) 13 August 2011. *The Naturalist 136*, p215.

Ely, W.A. (2012) Ichneumons *in* Henderson, A. & Norris, A. Yorkshire Naturalist's Union Excursions in 2012. *The Naturalist* 137, p227-8.
Fitton, M.G., Shaw, M.R. & Gauld, I.D. (1988) Pimpline Ichneumon-flies. *Handbooks for the Identification of British Insects* Vol 7, Part 1.
Fordham, W.J. (1919) Notes on the Entomology of the Bubwith District. *The Naturalist* 44, p13-6, 70.
Fordham, W.J. (1920) New and Interesting Yorks. Hymenoptera. *The Naturalist* 44, 45, p181-2.
Fordham, W.J. (1924) *Ephialtes tuberculatus* Fourc., an Ichneumon Fly new to Yorkshire. *The Naturalist* 49, p309.
Fordham, W.J. (1926) Some Yorkshire Saw-flies and Ichneumon Flies . *The Naturalist* 51, p117-8.
Godfrey, A. & Whitehead, P.F. (2000) The Diptera, Coleoptera and other invertebrates recorded from oak sap-flows at Brayton Barff, North Yorkshire. *Br. J. Ent. Nat. Hist.* 14(2): 65-81
Hammett, J. & Hammett, T. (1985) Thursday, 16th May, 1985. Potteric Carr. *Rotherham Naturalists' Society Newsletter* 1985/2, p10-1.
Hincks, W.D (1943) Coleoptera and Other Orders *in* Anon Yorkshire Naturalists at Scarborough. *The Naturalist* 68, p122-3.
Hincks, W.D. (1944) Hymenoptera *in* Anon The Yorkshire Naturalists' Union's Eighty-second Annual Report. *The Naturalist* 69, p36-8.
Hincks, W.D. (1951) Hymenoptera *in* Anon The Yorkshire Naturalists' Union Eighty-ninth Annual Report. *The Naturalist* 76, p26-9.
Hincks, W.D. (1953) X. Hymenoptera excluding Aculeata. *in* Anon The Entomology of Spurn Peninsula. *The Naturalist* 78, p129-39.
Hincks, W.D. (1955) Hymenoptera *in* Anon The Yorkshire Naturalists' Union Ninety-third Annual Report. *The Naturalist* 80, p21-2.
Hincks, W.D. & Dibb, J.R. (1940) Some Northern records of Ichneumonidae. *The Naturalist* 65, p173-6.
Humberstone, P. & Ely, W.A. (1986) Saturday, 10th August, 1985 - Tinsley Sewage Farm. *Rotherham Naturalists' Society Newsletter* 1986/1, p12.
Key, R. (1987) *Invertebrate Site Register Report 77II - North Yorkshire - East*. NCC.
Mayhew, P.J., Dytham, C., Shaw, M.R. & Fraser, S.E.M. (2009) Collections of ichneumonid wasps (subfamilies Diacritinae, Diplazontinae, Pimplinae and Poemeniinae) from woodlands near York and their implications for conservation planning. *The Naturalist* 134, p 3-24.
Morley, B. (1918) Yorkshire Naturalists' Union: Entomological Section. *The Naturalist* 43, p398-9.
Morley, C. (1908) *Ichneumonologia Britannica. The Ichneumons of Great Britain. III. Pimplinae.* London: Brown.
Roebuck, W.D. (1907) Hymenoptera. *in* Page, W *A History of Yorkshire Vol 1*. Constable & Co., London
Shaw, M.R. (2006) Notes on British Pimplinae and Poemeniinae (Hymenoptera, Ichneumonidae), with additions to the British List. *British Journal of Entomology & Natural History* 19, p217-38.
Skidmore, P. (2006) An Inventory of the Invertebrates of Thorne and Hatfield Moors. *Thorne and Hatfield Moors Monograph* 2.
Skidmore, P., Limbert, M. & Eversham, B.C. (1987) The Insects of Thorne Moors *Sorby Record* **23** (Supplement): 89-[153].
Walsh, G.B. & Rimington, E. (1956) *Natural History of the Scarborough District*. Scarborough Field Naturalists' Society.
Whiteley, D. (1989) Hoverflies and other notable Insects at Tinsley Sewage Farm. *Sorby Record* 25, p97-8.
Wilson, T. (1881) Ichneumonidae at York. *The Naturalist* 6, p153

Gains and losses of the *Andrena* and *Panurgus* mining bees (Hym., Andrenidae) in Watsonian Yorkshire

M. E. Archer
Email: marcher756@btinternet.com

The aims of this paper are to assess the gains and losses of species of the Andrenidae from the 19th century until 2012 and to try to assess changes in their abundance during the first and last fifty years of the 20th century. All the records are derived from the Watsonian Yorkshire electronic database. To 2012 this database consists of 33,752 records, of which 4,690 are records of the Andrenidae.

Yorkshire quality coding for the solitary aculeates is based on the number of 1km squares in which each species has been found. Currently to 2010 there are four categories of more or less equal numbers of species: Rare (wasps: 1-7; bees: 1-10), Occasional (wasps: 8-23; bees: 11-27), Frequent (wasps: 24-44; bees: 29-68) and Common (wasps: 46-122; bees: 69-238). The solitary wasps and bees are treated separately since bees are represented by more records.

Results and Analysis

Thirty-five species of *Andrena* and one species of *Panurgus* have been recorded in Watsonian Yorkshire. Two of them (*A. falsifica* recorded in the 1920s and *A. labiata* recorded in the 1920s and 1940s) are considered to be extinct in the county and the records are well to the north of their current British distributions.

Five species (*A. ovatula*, *A. pilipes*, *A. similis*, *A. tibialis* and *P. banksianus*) were first recorded in the second half of the 20th century and, except for *A. pilipes* and *P. banksianus*, are still being recorded in the 21st century. *A. pilipes* was last recorded in the 1950s and *P. banksianus* was recorded in the 1970s and 1980s and both are now considered to be extinct in Yorkshire, being well to the north of their current British distributions. *A. synadelpha* was first recorded in the 21st century while *A. nitida* was recorded in the 19th century, not at all during the 20th century but re-recorded during the 21st century.

In summary, four species (*A. falsifica, A. labiata, A. pilipes* and *P. banksianus*) have been lost between the 19th century and 2012 while four species (*A. ovatula, A. similis, A. synadelpha* and *A. tibialis*) have been gained.

The numbers of records of the 28 species recorded during the 20th century were divided into those records from the first fifty years and those from the last fifty years, which are plotted against each other in Fig. 1. Despite the lack of any fixed method for species recording there does seem to be some correlation of the species between the two time periods. A significant correlation coefficient of 0.63 ($p < 0.01$) was found by using a nonparametric correlation test of Spearman rank correlation.

Since the correlation of these two data sets is not perfect (correlation coefficient = 1.0) some species will show increases or decreases of abundances between the two data sets. During the first fifty years there were fewer records (939) than during the last fifty years (2665). In order to make a comparison between the two data sets the numbers of records for each species during each fifty year period were converted into percentages. The percentage decreases or increases between the two data sets for each species can then be calculated and are shown in Table 1.

Table 1. The percentage change in the number of records for each *Andrena* species between 1900-1949 and 1950-1999 with Chi-square test of significance (P).

Species	1900-1949	1950-1999	1950-1999 Adjusted	% change	P
Significant Loss					
ruficrus	24	19	6.69	-72.1	<0.01
fuscipes	31	39	13.74	-55.7	<0.01
lapponica	52	77	27.13	-47.8	<0.01
semilaevis	63	100	35.23	-44.1	<0.01
wilkella	44	76	26.78	-39.1	<0.05
cineraria	75	137	48.27	-35.6	<0.05
Significant Gain					
minutula	9	73	25.72	+185.8	<0.01
nigroaenea	31	265	93.37	+201.2	<0.01
subopaca	9	80	28.19	+213.2	<0.01
*chrysosceles**	13	199	70.12	+439.4	<0.01
*humilis**	1	23	8.10	+710.4	<0.05
No significant change – Common & Frequent Species					
barbilabris	62	133	46.86	-24.4	N.S
clarkella	54	118	41.58	-23.0	N.S.
fucata	41	92	32.42	-20.9	N.S.
denticulata	16	39	13.74	-14.1	N.S.
haemorrhoa	147	404	142.35	-3.2	N.S.
carantonica	114	369	130.02	+14.0	N.S.
fulva	51	177	62.37	+22.3	N.S.
bicolor	28	110	38.76	+38.4	N.S.
No significant change – Occasional & Rare Species					
varians	7	7	2.47	-64.8	N.S.
labialis	1	1	0.35	-64.8	N.S.
angustior	11	15	5.29	-52.0	N.S.
coitana	12	17	5.99	-50.1	N.S.
thoracica	2	3	1.06	-47.1	N.S.
tarsata	25	39	13.74	-45.0	N.S.
praecox	7	16	5.64	-19.5	N.S.
helvola	7	25	8.81	+25.8	N.S.
nigriceps	2	12	4.23	+111.4	N.S.

*these species are illustrated in Plate II, centre pages.

To determine if the differences between the first and second fifty years are significant a chi-square test was carried out for each species. Whether the difference was significant or not significant (N.S.) for each species is given in Table 1. Six of them show significant decreases, five show significant increases and 17 show no significant differences. The 'no-significance' ones can be divided into two groups depending on their quality coding: ‘Common’ and ‘Frequent’ species versus ‘Occasional’ and ‘Rare’ ones (Table 1).

Discussion

The four species that have been lost are currently mainly distributed in southern England. These can now be regarded either as records of vagrants or as indicators of a previously more widespread British distribution. The four species gained could be a consequence of an increase in the number of recorders (Archer, 2002) who have explored more of Watsonian Yorkshire during the last fifty years compared with the first fifty years of the 20th century. In addition, a more favourable climate could cause a northward extension of the distribution of these bees.

The validity of the calculated changes in species abundances seems surprising in view of the lack of any fixed recording procedure throughout the 20th century. Nevertheless, the significant relationship between the data sets (Fig. 1) would seem to support the validity of the changes in species abundances.

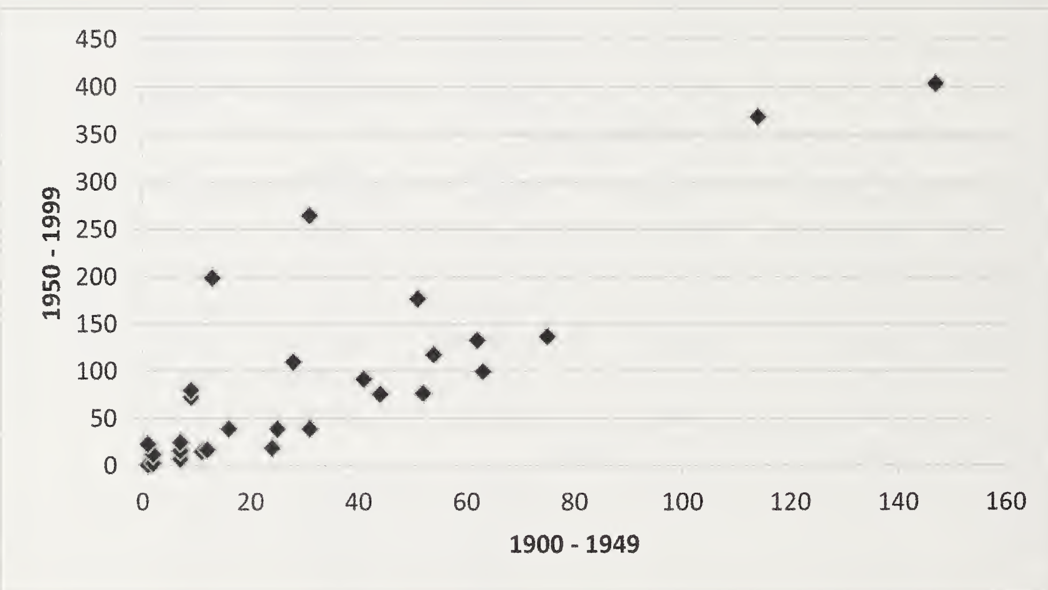


Fig. 1 The number of records of *Andrena* species during 1900-1949 compared to the number during 1950-1999

The decreases in abundance could be due to the loss of suitable habitats. Several of these bees, e.g. *A. ruficrus* and *A. fuscipes*, require open sandy sites which have been reduced under the influence of intensive agriculture. Increases in abundances could be due to more

favourable weather conditions resulting in the occurrence of a second generation, e.g. *A. nigroaenea*, or a northward extension of a species distribution, e.g. *A. humilis*.

The no-significance 'Common' and 'Frequent' bees represented by a relatively larger number of records indicate no change in their abundance. The no-significance 'Occasional' and 'Rare' bees are represented by a relatively smaller number of records, so a Chi-square test would not be able to show significant differences. By comparison with those showing significant decreases (Table 1), the no-significance 'Occasional' and 'Rare' bees showing similar percentage decrease changes, except for *A. labialis, A. thoracica* and *A. praecox,* could be considered under threat (Table 1).

References

Archer, M.E. (2002) *The Wasps, Ants and Bees of Watsonian Yorkshire*. Yorkshire Naturalists' Union, York.

Erratum - Tree colonisation following sheep exclusion alongside the A169 across the North York Moors

Unfortunately an erroneous version of a table was included in Ray Goulder's article on p106 of *The Naturalist* 138. The correct version is printed below.

Table 3. Number of trees and shrubs recorded May-June 2012 in 10m radius circular quadrats in areas of Dalby Forest clear-felled in 1996.

Species of tree/shrub	*Quadrat 1		†Quadrat 2	
	>2 m height	Total	>2 m height	Total
Abies grandis (Giant Fir)	0	0	1	1
Betula pendula (Silver Birch)	28	39	12	20
Betula pubescens (Downy Birch)	19	23	26	44
Fagus sylvatica (Beech)	1	1	2	6
Ilex aquifolium (Holly)	0	3	0	1
Larix sp. (Larch)	80	85	79	87
Pinus sylvestris/contorta (Pine)	3	3	0	0
Quercus robur (Pedunculate Oak)	9	12	10	16
Sorbus aucuparia (Rowan)	11	25	18	47
Total of all species	151	191	148	222
Tree density (per hectare)	4809	6083	4713	7070

*Quadrat 1 centred at SE 85158574; †Quadrat 2 centred at SE 8521 8581. Area of quadrats = 314 m^2.

We apologise for this error. Eds.

Robert Wynne Owen (1924-1985) and his parasitological collections at Leeds: 1. Microscope slides and fish parasites

R. A Baker, C. Bradley[2] and P. J. Mill
School of Biology, University of Leeds, Leeds, LS2 9JT

Wynne, as he was affectionately called, died on 30 October 1985 on the campus of the University of Leeds on his way to give a lecture to a class of first year students (Jennings, 1985, 1986). He was born in Southampton in 1924 and his father was Chief Engineer on the *Aquitania*. The family later moved to Motherwell, to help with the business of a relative based there, and Wynne went to Hamilton Academy. When Wynne was 15 his family moved to Aberystwyth, medical advice suggesting that his father should be by the sea (Gwynneth Owen, pers. comm.). Wynne graduated from Aberystwyth University College (part of the University of Wales) in 1944 with an Upper Second Class Honours Degree in Zoology. Following two years at the Department of Scientific and Industrial Research, Pest Infestation Laboratory in Slough, he became a research assistant in the Department of Animal Health in Aberystwyth, obtaining an MSc in 1948 for 'Studies on the helminth parasites of domestic birds in mid and west Wales' followed by a PhD in 1951 for 'Studies on the pre-adult stages of certain nematode parasites of herbivores' (information from David Currie). He married Gwynneth in 1951 and joined the staff of the Zoology Department at the University of Leeds in 1952 as the replacement for Llewellyn Lloyd, who had retired from a Readership in Entomology and Protozoology.

Wynne was promoted to a Senior Lecturership in 1967 and was a very stimulating teacher. In 1988, the Wynne Owen Prize was instituted for an outstanding zoological laboratory project carried out by a final year undergraduate and a number of recipients of this prize have gone on to do postgraduate research for a PhD Away from the academic world, Wynne's main interests were in music and singing. He was Chairman of the 120 member strong Leeds Festival Chorus and sung tenor with them for nearly thirty years (*Yorkshire Post*, 1 November, 1985).

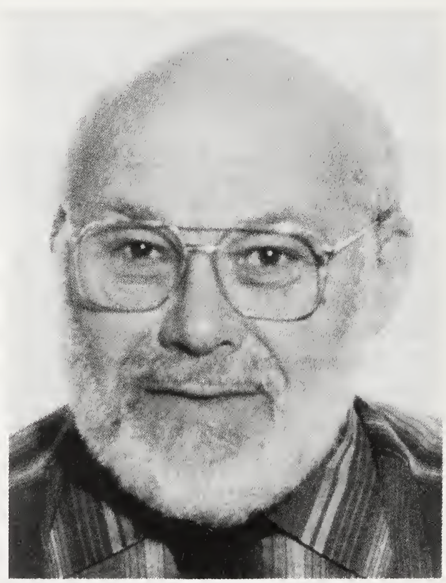


Figure 1. Dr Robert Wynne Owen

Wynne's research interest was in parasitology and centred mainly on the parasites of freshwater and marine fish, in which he trained a succession of postgraduate students, including some from North and South America and Africa. (Jennings, 1985, 1986). Indeed, Dick Tinsley, one of these students,

[2] Current address: 9 Cammell Walk, Waterbeach, Cambridge CB25 9LT

notes that "Owen produced quite a 'stable' of PhD students, including, among others Chris Arme, Les Chappell, Roger Sweeting, John Riley, Geoff Boxshall, plus some who went to Canada as faculty members" (Esch, 2007). Many of these have gone on to distinguished academic careers. As part of a final year Honours student project at the University of Leeds, one of the authors (CB) contacted some of these people in 1999 and it is clear he was held in high regard and with affection (Bradley, 1999). The comments she received included statements such as, "I would not have been anywhere without Wynne's guidance when I began…his enthusiasm for the discipline…a benign, non-interfering but very supportive supervisor…humour and mirth abounded…he was a man and a half with a huge appetite for fun and work". Jennings, in his obituaries (Jennings, 1985, 1986), described his "warm, extrovert personality and deep interest in people…his innate sense of justice and fair play… and … [he was]…an irreplaceable mentor, colleague and friend". Boxshall noted that "He was a lovely person who took a special field course devoted to fish parasites …." (Osore, M., 2002). The authors of this article confirm all of the above and one (PJM) adds that he was the ideal person with whom to discuss problems – always willing to listen and offer helpful advice.

Over many years Wynne accumulated a valuable spirit collection of parasites and some of these have been found, arranged and documented since his death (Bradley. 1999). There is also a large collection of microscope slides of parasites, mostly made by Wynne but some by his students. All of this material is described here. In the 1980 University of Leeds guide to current research, Wynne's research interests are listed as "Host-parasite relationships involving both invertebrate and vertebrate hosts. Ecological aspects of infections in fish, particularly with flukes and tapeworms. Immunological reaction to fluke infections. The protozoan parasites of molluscs."

Together with one of his students, he produced a reference list of freshwater fish parasites from Great Britain and Ireland (Chappell and Owen, 1969). The parasitic Crustacea of the North Sea have been investigated by Boxshall (1974), one of Wynne's postgraduate students, and the freshwater crustacean parasites of Yorkshire have been reviewed (Fryer, 1993). Boxshall (1987) also named a new genus and species of copepod after Wynne, *Wynnowenia distinctus* (Siphonostomatoida: Hatschekiidae) (Boxshall, 2001; Walter, 2012). A parasitic trematode, *Renicola glacialis*, from the kidney of the Fulmar *Fulmarus glacialis,* was described by Wynne and another of his postgraduate students (Riley & Owen, 1972).

The present paper deals with his collection of fish parasites. His collection of parasites of amphibians, reptiles, birds and mammals will be described in a subsequent paper (Baker & Mill, in prep.)

R. W. Owen's collections

Spirit Collections

1) A collection of parasitic Crustacea (marine and freshwater), made in the 1960s and 1970s, was deposited in the Leeds City Museum by Wynne Owen in 1981 (Acc. No LEEDM. C. 1981. 2). Hartley *et al.* (1987) lists it as IDEN 4527YH. It includes host details, dates and places of collection, collector's names (if different to Owen) and dates recorded in the database. Some of the 1960s material is attributed to Dr R. S. Brown and one specimen to each of K. Sadler and J. Langston. 64% of the specimens for which there is locality information are from Yorkshire (including the North Sea) (Table 1).

Table 1. Parasitic Crustacea Maxillopoda in the collections at Leeds City Museums. In addition to those listed are an unidentified copepod from the mouth of a perch from Roundhay Park Lake, Leeds, an isopod, *Anilocra* sp. on a fish host from Roscoff, France and a Turtox (professionally made) specimen labelled as *Pardalotus ornatus* (a copepod?). They are all parasites of fish with the exception of *Peltogaster*. (RHB=Robin Hood's Bay, Yorkshire)

Order/Family	Species	Host	Site on host	Location
		Copepoda		
Order Siphonostomatoida				
Caligidae				
	Caligus curtus	Cod *Gadus morhua*		North Sea
	Caligus diaphanus	Grey Gurnard *Eutrigla gurnardus*		North Sea
	Caligus elongatus	Cod		North Sea
	Lepeophtheirus salmonis	Salmon *Salmo salar*		North Sea
	[1]*Lepeophtheirus thompsoni*	Turbot *Scophthalmus maximus*		North Sea
Eudactylinidae				
	Eudactylina similis	Starry Ray *Raja radiata*	Gills	RHB
Lernaeopodidae				
	Lernaeopodina longimana	Cuckoo Ray *Raja naevus*	Gills	RHB
	Lernaeopodina longimana	Spotted Ray *Raja montagui*	Gills	RHB
	Lernaeopodina longimana	Starry Ray	Gills	RHB
	[2]*Neobrachiella bispinosa*	Grey Gurnard		RHB
	Salmincola salmoneus	Salmon	Gills	Windermere, Cumbria
Order Cyclopoida				
Lernaeidae				
	Lernea cyprinacea	Goldfish		London
Order Poecilostomatoida				
Chondracanthidae				
	Acanthochondria cf *cornuta*	Flounder *Platichthys flesus*		Atlantic

Order/Family	Species	Host	Site on host	Location
	Chondracanthus lophii	Anglerfish *Lophius piscatorius*	Gill chamber	Atlantic
	Chondracanthus zei	John Dory *Zeus faber*		Atlantic
	Lernentoma asellina	Grey Gurnard		E. Atlantic
Ergasilidae				
	Thersitina gasterostei	Stickleback		North Sea
Branchiura				
Order Arguloidea				
Argulidae				
	Argulus sp.	Sticklebacks		Canal,Newlay Leeds
Thecostraca - Cirripedia				
Order Kentrogonida				
Peltogastridae	[3]*Peltogaster*	Common Hermit Crab *Eupagurus barnardus*		RHB

[1]Two tubes; [2]Now *Parabrachiella bispinosa*; [3]With the isopod hyperparasite *Athelges*.

2) A spirit collection of fish parasites, currently held in the Museum of the History of Science, Technology and Medicine in the School of Philosophy, Religion and History of Science at the University of Leeds, was studied and described briefly by Bradley (1999). This collection has a database with 134 entries (Bradley, 1999) and the host, position on the host, place and date of collection have been noted for many of the specimens (Tables 2-4); for 29 of the specimens there is only limited information. 80% of the specimens, for which there is locality information, are from Yorkshire.

Apart from the specimens mentioned in tables 2-4 there are a number of unidentified copepods found on Basking Shark *Cetorhinus maximu*s, the gills of Bib *Trisopterus luscus*, Whiting *Merlangius merlangus*, the gills of Haddock *Melanogrammus aeglefinus*, the mouth of Perch *Perca fluviatilis*, the gills of Plaice *Pleuronectes platessa*, the mouth of Saithe *Pollachius virens*, the gills of Thornback Ray *Raja clavata* and the gill chamber of Sole *Solea solea*, as well as larval copepods on the gill filaments of a ray *Raja* sp. Also in the collection are a number of thorny-headed worms (acanthocephalans) found in Three-spined Stickleback *Gasterosteus aculeatus*, the intestine of Perch, Minnow *Phoxinus phoxinus*, the intestine of Saithe, the intestine of Rainbow Trout *Oncorhynchus mykiss*, Mackerel *Scomber scombrus* and the intestine of Trout *Salmo trutta*; several nematodes found in Haddock, the small intestine of Perch, the intestine and rectum of Saithe and the intestine of Sole; and three leeches – from the skin of Thornback Ray, the gills of a catfish and the skin of a Sole. There are also specimens of a pseudophyllid cestode on Pollack *Pollachius pollachius*, trematodes on a mullet, eye flukes on Roach *Rutilus rutilus* and the microsporidian *Glugea* on a stickleback. The database is housed with the collection.

Table 2. Crustacea - Maxillopoda parasites in the collection at the University of Leeds – where complete or almost complete information is available.

Order/Family	Name	Host	Site on host	Location
		Copepoda		
Order Siphonostomatoida				
Caligidae	*Caligus curtus*	Cod		
	Caligus sp.	[1]Cyclopteridae		RHB
	Caligus sp.	Cod	Fin	RHB
	Caligus sp.	Plaice	Fin	RHB
	Caligus rapax	Cod		
	Lepeophtheirus pectoralis	Plaice	Skin	
	Lepeophtheirus salmonis	Salmon		
	Lepeophtheirus thompsoni	Turbot		
Eudactylinidae	[2]*Eudactylina similis*	Starry Ray	Gills	RHB
Lernaeopodidae	*Clavella adunca*	Cod	Gills	
	Clavella adunca	Cod		RHB
	[3]*Clavella adunca*	Cod		
	Clavella sp.	Whiting *Merlangius merlangus*	Gills	RHB
	Lernaeopoda sp.	Lesser Spotted Dogfish *Scyliorhinus canicula*		
	Lernaeopodina cluthae	Spotted Ray	Gills	RHB
	Lernaeopodina cluthae	Cuckoo Ray		
	Lernaeopodina cluthae	Cuckoo Ray	Gills	RHB
	Salmincola salmonea	Salmon	Gills	Windermere
	Salmincola gordoni	Trout	Gill chamber	Arthington, Leeds
Pennellidae	*Lernaeocera branchialis*	Whiting		RHB
	Lernaeocera lusci	Pouting *Trisopterus luscus*	Gills	
	Lernaeocera larvae	Flounder Plaice	Gills	
Order Poecilostomatoida				
Bomolochidae	[4]*Bomolochus* sp. + egg sacs	Cod		
	[4]*Bomolochus soleae*	Cod	Nose	RHB
	[4]*Bomolochus soleae*	Cod		
Ergasilidae	*Thersitina gasterostei*	Three-spined stickleback *Gasterosteus aculeatus*	Mouth/ gills	
	[3]*Thersitina gasterostei*	Three-spined stickleback		
Chondracanthidae	*Chondracanthus lophii*	Anglerfish	Gill chamber	
		Branchiura		
Order Arguloidea				
Argulidae	*Argulus* sp.	Three-spined stickleback		Canal – Newlay, Leeds

[1]Probably *Cyclopterus lumpus*; [2]Three tubes; [3]two tubes; [4]not a parasite of Cod - it should presumably be *Cresseyus confusus* (Stock, 1953) [syn. *Holobomolochus confusus* (Stock, 1953)]. Slide collection.

Table 3. Platyhelminth parasites in the collection at the University of Leeds – where complete or almost complete information is available.

Order/Family	Name	Host	Site on host	Location
Platyhelminthes - Cestoda - Eucestoda				
Order Bothriocephalidea				
Bothriocephalidae	*Bothriocephalus*	Bullhead *Cottus gobio*	Intestine	Plymouth
Triaenophoridae	*Triaenophorus*	Pike *Esox lucius*	Intestine	
	Eubothrium crassum	Trout *Salmo trutta*	Intestine	Thirsk, Yorkshire
	Eubothrium	Perch *Perca fluviatilis*	Intestine	Malham, Yorks.
Order Gyrocotylidea				
Gyrocotylidae	*Gyrocotyle*	*Chimaera sp.*	Stomach	
Order Rhinebothriidea				
Rhinobothriidae	[1]*Sphaerobothrium lubeti*	Eagle Ray *Myliobatis aquila*		RHB
Order Spathebothriidea				
Cyathocephalidae	*Cyathocephalus truncatus*	Trout	Pyloric caeca	Driffield, Yorks.
Order Tetraphyllidea				
	Tetraphyllid	Starry Ray	Spiral valve	RHB
Order Trypanorhyncha				
Sphyriocephalidae	*Hepatoxylon sp*	Salmon *Salmo salar*	Body cavity	
	Trypanorhynchan plerocercoid	Ray's Bream *Brama brama*	Muscles	RHB
	Trypanorhynchan plerocercoid	Halibut	Muscles	Leeds market
	Trypanorhynchan plerocercoid	Cuckoo Ray	Muscles	RHB
Platyhelminthes - Monogenea				
Order Dactylogyridea				
Dactylogyridae	*Dactylogyrus*	Koi Carp *Cyprinus carpio*	Gills	Burrows, Wakefield
	Dactylogyrus	Roach *Rutilius rutilus*	Gills	Roundhay Lake, Leeds
Order Monocotylidea				
Monocotylidae				
	Calicotyle	Starry Ray	Rectum	RHB
	Calicotyle	Thornback Ray		RHB
	Calicotyle	Thornback Ray	Rectum	RHB
	Dictyocotyle	Saithe *Pollachius virens*	Gills	
	Dictyocotyle	Cod	Gills	RHB
Order Mazocraeidea				
Discocotylidae	*Discocotyle*	Trout	Gills	Chelker reservoir, Yorks.

Order/Family	Name	Host	Site on host	Location
	Discocotyle	Cuckoo Ray	Intestine	RHB
Diclidophoridae	*Diclidophora sp.*	Saithe	Gills	
Mazocraeidae	*Mazocraes alosae*	Twaite Shad *Alosa fallax*	Gills	Plymouth
	Platyhelminthes – Trematoda - Digenea			
Order Gasterostomata				
	gasterostomatan	Anglerfish		RHB
Order Azygiida				
Hemiuridae		Saithe	Stomach	RHB
Order Plagiorchiida				
Gorgoderidae	*Phyllodistomum*	Pike		
	Phyllodistomum	Minnow		Boston Spa, Yorks.
Zoogonidae	*Zoogonoides viviparous*	Plaice	Rectum	RHB
Order Strigiidida				
Bucephalidae		Conger eel *Conger conger*	Small intestine	Plymouth
		Conger eel	Rectum	Plymouth

[1]Synonym of *Rhodobothrium lubeti* (Euzet, 1959).

Table 4. Nematode parasites in the collection at the University of Leeds – where complete or almost complete information is available.

Order/Family	Name	Host	Site on host	Location
		Secernentea - Spiuria		
Order Spirurida				
Camallanidae	*Camallanus*	Eel	Intestine	Windermere, Cumbria
Cystidicolidae	*Cystidicola*	Trout		Wray Castle, Cumbria
	Cystidicola	Rainbow Trout [1]*Salmo gairdneri irideus*		Driffield, Yorkshire
	Ascarophis morrhuae	Haddock *Merlanogrammus aeglefinus*		
Physalopteridae	*Proleptus*	Lesser Spotted Dogfish	Intestine	
Order Ascaridida				
Cucullanidae	*Cucullanus*	Conger eel	Intestine	Plymouth
		Enoplea - Enoplia		
Order Enoplida				
Trichuridae	*Capillaria*	Trout		Embsay reservoir, Yorkshire

[1]Synonym of *Oncorhynchus mykiss* (Walbaum, 1792).

Slide Collection

The collection of c.850 slides made by Wynne and some of his students is now housed at the Discovery Centre, Leeds City Museums, and is available to students from the university or, indeed, to any individuals who may wish to examine the slides. They are almost entirely of parasites and include representatives of the Protozoa (Apicomplexa and Heterokontophyta), Acanthocephala, Crustacea, Insecta, Nematoda (Adenophorea and Secernentea) and Platyhelminthes (Cestoda, Monogenea, Trematoda, Digenea and Turbellaria) (Table 5).

In terms of fish hosts, parasites of 12 species of freshwater fish and 12 of marine fish are present in the collection. There are also parasites from Grass Snake *Natrix natrix*, Frog *Rana temporaria*, 14 birds and five mammals. The material from Aberystwyth in the late 1940s comprises mainly parasites of mammals and birds. After Wynne's move to Leeds in 1952, the slides are from sites in Yorkshire, both freshwater and marine, the latter mainly from Robin Hood's Bay. There are also slides from Plymouth from the early 1950s.

Microscope slides and spirit specimens are now rarely used in teaching undergraduates and there is a risk that such collections are becoming neglected or even discarded. Such objects are in need of protection, conservation and documentation (Baker & Mill, 2005, 2006).

Table 5. Summary of the slide collection showing the orders for which specimens are present.

Phylum	Class	Subclass	Order
Acanthocephala	Archiacanthocephala		Moniformida
	Palaeacanthocephala		Echinorhynchida
Crustacea	Maxillopoda	Copepoda	Cyclopoida
		Copepoda	Monstrilloida
		Copepoda	Siphonostomatoida
		Branchiura	Arguloida
Insecta			Siphonaptera
Chordata	Tunicata	Ascidiacea	Enterogona
Nematoda	Adenophorea		Mermithida
			Trichurida
	Secernentea	Rhabditia	Strongylida
		Spiruria	Ascarida
			Camallanida
			Oxyurida
			Spirurida
Platyhelminthes	Cestoda	Eucestoda	Bothriocephalidea
			Caryophillidea
			Cyclophyllidea
			Diphyllidea
			Haplobothrioidea

Phylum	Class	Subclass	Order
			Proteocephalidea
			Pseudophyllidea
			Rhinobothriidea
			Spathebothriidea
			Tetrabothriidea
			Tetraphyllidea
			Trypanorhyncha
	Monogenea	Monopisthocotylea	Capsalidea
			Dactylogyridea
			Gyrodactylidea
			Monocotylidea
		Polyopisthocotylea	Diclybothriidea
			Diplozoidea
			Mazocraeidea
			Polyopisthocotylea
			Polystomatidea
	Trematoda	Digenea	Azygiida
			Diplostomida
			Echinostomida
			Gasterostomata
			Opisthorchiida
			Plagiorchiida
			Strigeidida
	Turbellaria		Macrostomida
			Polycladida
			Tricladida
Apicomplexa	Conoidasida	Coccidiasina	Eococcidiorida
		Gregarinasina	Eugregarinoida
Heterokontophyta	Opalinea		Opalinida

Summary
Wynne Owen was at the University of Leeds for over 30 years. His work, spirit collections and microscope slides, mainly of fish parasites, are described. Such collections as those documented here form a valuable reference of both biological and historical importance. There is a serious risk of such collections being disposed of, because they are no longer regarded as important in teaching and are currently out of vogue. However, workers on biodiversity studies and recording dataset networks in both freshwater and marine and coastal studies should find these records of value. Many of the records refer to the parasites of British fish.

Acknowledgements.
The authors would like to thank the following for their help – Geoff Boxshall, Kate Arnold-Forster, David Currie, Joe Jennings and Gwynneth Owen; also, from the Discovery Centre, Leeds City Museums, Clare Brown, Kirsty Garrod, Rebecca Machin and Rachel Marshall and,

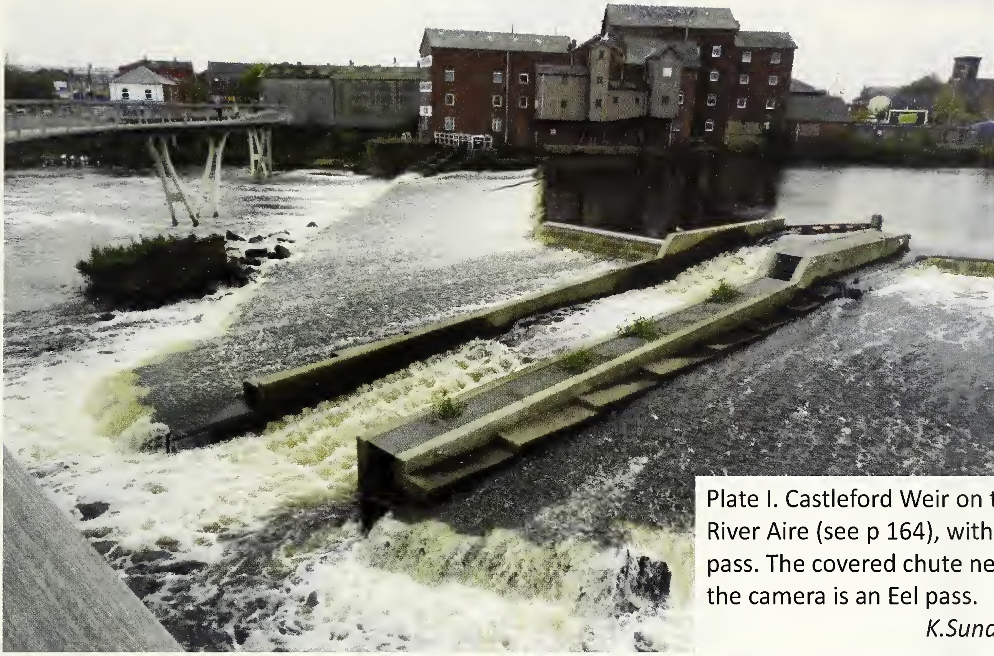


Plate I. Castleford Weir on the River Aire (see p 164), with its fish pass. The covered chute nearest the camera is an Eel pass.

K.Sunderland

Plate II. Solitary bees which have shown changes in their Yorkshire abundance (see p189).

Above left: *Andrena humilis* female *Jeremy Early*

Above right: *Andrena chrysosceles* male *Steven Falk*

Plate III.

Heath Snail *Helicella itala* at Holm Dale showing its distinctive shell shape (see p207).

David Lindley

Plate IV. Activities at Ox Close Wood (see p212).
Top left: A working session. *Above*: Testing the home-made coracle.
Right: Charcoal-burning in progress. *Melanie Smith*

Plate V. Rare plants at Ox Close Wood (see p212).
Left: Herb Paris *Paris quadrifolia* *Right*: Yellow Star-of-Bethlehem *Gagea lutea*. *Margaret Moseley*

Plate VI. YNU Excursions to Cromwell Bottom VC63 (see p221) and Danes Dyke, Flamborough VC61 (see p233).
Above: David Lindley (left) at Cromwell Bottom talking to YNU members and local naturalists.
Right: Yellow Bird's-nest *Monotropa hypopitys*, found in flower on a follow-up visit.
Below: Flamborough Head from above the south end of the Dyke.
Bottom: Insects found on the VC61 Excursion included the stiltbug *Metatropis rufescens* (new to VC61) and Small Skippers feeding on Knapweed *Centaurea nigra*. *Joyce & Paul Simmons*

Plate VII. YNU Excursion to Nosterfield VC65 (see p229).

Top: Orchids *Dactylorhiza* sp. growing in profusion.

Above left: The lepidoptera group recording and releasing the 151 species of moths found in their traps.

Above right: Great Horsetail *Equisetum telmateia* growing with Wood Crane's-bill *Geranium sylvaticum*.

Right: Blue Fleabane *Erigeron acer*. *Terry Whitaker*

from the School of Philosophy, Religion and History of Science, University of Leeds, Claire Jones and Kiara White.

R. Wynne Owen – [3]Publications

Arme, C., and Owen, R. W., (1964) Massive infections of the three-spined stickleback with *Schistocephalus solidus* (Cestoda: Pseudophyllideae) and Glugea anomale (Sporozoa: Microsporidia). *Parasitology* **54:** 10-11

Arme, C., and Owen, R. W., (1965) Ligulosis in cyprinid fishes : a unique form of parasite interference with a vertebrate reproductive cycle. *Parasitology* **55**: 7.

Arme, C. and Owen,R. W. (1967) Infections of the three spined stickleback, *Gasterosteus aculeatus* L., with the plerocercoid larvae of *Schistocephalus solidus* (Müller, 1776) with special reference to pathological effects. *Parasitology* **57:** 301-314.

Arme, C. and Owen, R.W. (1968) Occurrence and pathology of *Ligula intestinalis* infections in British fishes. *Journal of Parasitology* **54:** 272-280.

Arme, C. and Owen, R.W. (1970) Observations on a tissue response within the body cavity of fish infected with the plerocercoid larvae of *Ligula intestinalis* (L.) (Cestoda: Pseudophyllidea). *Journal of Fish Biology* **2:** 35-37.

Chappell, L.H. and Owen, R.W. (1969) A reference list of parasite species recorded in freshwater fish from Great Britain and Ireland. *Journal of Natural History* **3:** 197-216.

Mellors, P. J. & Owen, R. W. (1980) Some observations on the biology of a gasterostome digenetic fluke *Rhipidocotyle campanula* (Duj, 1845) of fish in the River Aire, Yorkshire . *Parasitology* 81: xlviii.

Owen, R. W. (1951) The helminth parasites of domesticated birds in Mid Wales. *Journal of Helminthology* **25:** 105-130.

Owen, R. W. & Arme, C. (1965) Some observations on the distribution of *Ligula* plerocercoids in British freshwater fishes. *Parasitology* **55:** 6.

Owen, R. W. & Coleman, G. S. (1976) The cultivation of the rumen ciliate *Entodinium longinucleatum*. *Journal of Applied Bacteriology* **41:** 341-344.

Owen, R. W. & Coleman, G. S. (1977) The uptake and utilization of bacteria, amino acids and carbohydrates by the rumen ciliate *Entodinium longinucleatum* in relation to the sources of amino acids for protein synthesis. *Journal of Applied Bacteriology* **43:** 67-74.

Owen, R W and Pemberton, R T (1962). Helminth infection of the starling (*Sturnus vulgaris* L.) in Northern England. *Proceedings of the Zoological Society of London* **139:** 557-587.

Riley, J. & Owen, R.W. (1972) *Renicola glacialis* sp. nov., a new trematode from the North Sea Fulmar, *Fulmarus glacialis* (L.), with observations on its pathology. *Journal of Heminthology* **46:** 63-72.

Riley, J. and Owen, R. W. (1975) Competition between two closely related *Tetrabothrius* cestodes of the fulmar (Fulmarus glacialis L.). *Zeitschrift für Parasitenkunde* **46:** 221-228.

Riley, J. & Owen, R.W. (1972) *Renicola glacialis* sp. nov., a trematode from the North Sea Fulmar, *Fulmarus glacialis* (L.), with observations on its pathology. *Journal of Heminthology* **46:** 63-72.

Tinsley, R. C. and Owen, R. W. 1975. Studies on the biology of *Protopolystoma xenopod~s* (Monogenoidea): the oncomiracidium and life-cycle. *Parasitology* **71:** 445-446

Tinsley, R.C. & Owen, R.W. (1978) The morphology and biology of *Xenopodistomum xenopodis* from the gall bladder of the African clawed toad, *Xenopus laevis*. *Journal of Helminthology* **53:** 307-316.

[3] Complete to the best of our knowledge.

References

Baker, R. A. and Mill, P. J. (2005) Endangered species - The zoological microscope slide collection at the University of Leeds. *Quekett Journal of Microscopy* **40:** 3-11.

Baker, R.A. And Mill, P.J. (2006) Further notes on the zoological microscope slide collection at the University of Leeds: Sigmund mounts. Queckett Journal of Microscopy **40**: 343-352.

Baker, R. A. & Mill. P. J. (in prep.) Robert Wynne Owen (1924-1985) and his parasitological collections: 2. Parasites of amphibians, reptiles, birds and mammals.

Boxshall, G. A. (1974) Infections with parasitic copepods in North Sea marine fishes. *Journal of the Marine Biological Association* **54:** 355-372.

Boxshall, G. (2001). Copepoda (excl. Harpacticoida) *in*: Costello, M. J., Emblow, C. & White, R. J.(eds). European register of marine species: a check-list of the marine species in Europe and a bibliography of guides to their identification. *Collection Patrimoines Naturels* (Muséum national d'Histoire naturelle, Paris) **50:** pp. 252-268.

Bradley, C. (1999) The fish parasite collection of Wynne Owen and more recently collected material. *Unpublished student final year project Department of Biology, University of Leeds.* 74 pp.

Chappell, L.H. and Owen, R.W. (1969) A reference list of parasite species recorded in freshwater fish from Great Britain and Ireland. *Journal of Natural History* **3:** 197-216

Esch, G. W. (2007) *Parasites and Infectious disease: discovery by serendipity and otherwise*. Cambridge University Press, New York. pp 26, 27.

Fryer, G. (1993) *The freshwater crustacea of Yorkshire – a faunistic and ecological survey*. Yorkshire Naturalists' Union and Leeds Philosophical and Literary Society. 1-312.

Hartley, M. M., Norris, A., Pettitt, C. W., Riley, T. H and M A Stier (1987) *Register of Natural Science Collections in Yorkshire and Humberside.* Area Museum and Art Gallery Service for Yorkshire and Humberside. 89 and183.

Jennings, J.B. (1985) Obituary R. Wynne Owen. *The Reporter*, The University of Leeds, No. 245. 8 November 1985: 3.

Jennings, J.B. (1986) Obituary Dr R. Wynne Owen. *The University of Leeds Review* **28:** 342-343.

Osore, M. (2002) An Interview with Dr Boxshall. *Monoculus: The Newsletter of the World Association of Copepodologists* **44:** 9-11.

Riley, J. & Owen, R.W. (1972) *Renicola glacialis* sp. nov., a trematode from the North Sea Fulmar, *Fulmarus glacialis* (L.), with observations on its pathology. *Journal of Heminthology* **46:** 63-72.

Tinsley, R. C., Owen, R.W. (1975). Studies on the biology of *Protopolystoma xenopodis* (Monogenoidea): the oncomiracidium and life-cycle. *Parasitology* **71:** 445-46.

Tinsley, R.C. & Owen, R.W. (1978) The morphology and biology of *Xenopodistomum xenopodis* from the gall bladder of the African clawed toad, *Xenopus laevis*. *Journal of Helminthology* **53:** 307-316

Web site

Walter, T. C. (2012). *Wynnowenia* Boxshall, 1987. In: Walter, T.C. & Boxshall, G. (2012). World Copepoda database: http://www.marinespecies.org/copepoda/aphia.php?p=taxdetails&id=348182

A provisional vascular plant red data list for VC63 (S.W. Yorkshire) The first season's fieldwork - a review

G.T.D. Wilmore
email: consultecol.wilmore@btinternet.com

Introduction

In 2012, I announced plans to begin working towards the production of a Red Data Plant List for VC63 (Wilmore, 2013a) and gave a fairly comprehensive inventory of plant taxa which are (or were!) known to be rare or scarce in the vice-county. This list of plants was broken down into several categories: 1) Native Species; 2) Native Species Presumed Extinct in the VC; 3) Hybrids; 4) Archaeophytes; 5) Grey Area Species – Native or Introduced; and 6) Unconfirmed Species. The drawing up of this list was assisted and informed by Cheffings & Farrell (2005), in which various Threat Categories of Rarity are employed using IUCN (International Union for the Conservation of Nature and Natural Resources, now The World Conservation Union (WCU)) criteria. These are: Extinct (EX); Extinct in the Wild (EW) – (i.e., surviving only in captivity); Critically Endangered (CR); Endangered (EN); Vulnerable (VU) and Near Threatened (NT). In addition, there are three further categories which are not considered to be of nature conservation concern: Least Concern (LC); Data Deficient (DD) (i.e., where insufficient data exist to make a definite assessment of risk) and Not Evaluated (NE) (where no evaluation has been made against the IUCN criteria). A mention should also be made of the Waiting List (WL), adopted to cater for taxa for which there was either insufficient data, taxonomic uncertainty or uncertainly over native, archaeophyte or neophyte status, and also the Parking List (PL), where insufficient data are present to assign plants to other categories or where there is evidence that they are neophytes.

The terms 'archaeophyte' and 'neophyte' were mentioned in Preston, Pearman & Dines (2002) and refer to plants which have been introduced by various means throughout the past 2000 or so years, since the Roman occupation of these islands. Archaeophytes refer to those plant taxa which became naturalised before 1500AD, while neophytes are those which have been introduced since 1500AD, according to documentary evidence.

A leaflet was circulated towards the end of 2012 (Wilmore, 2014 in prep.) outlining a proposed field work methodology and a selection of species, some of which it was hoped to target during the 2013 field season. In addition, seven field trips were announced, to: 1) Mosaic Reserve, Austerfield, 2) Anston Stones Wood and grassland, 3) Maltby Low and Far Commons, 4) Cusworth Country Park, 5) Stanley Marsh, Stanley Ferry Flash and Southern Washlands, 6) Cromwell Bottom and the Calder and Hebble Canal and 7) Potteric Carr. Six of these were visited with excellent data recording being achieved - only the Stanley Marsh and associated venues had to be cancelled, as dense and invasive willow and birch scrub had encroached in several of these areas and the targeted rare plants could not be located. As well as the above organised field excursions, several botanists undertook personal fieldwork and provided additional records which have swelled the overall database.

The purpose of this paper is to list and review the Red Data Plant Inventory after this first season's fieldwork. To achieve anything approaching a reasonably comprehensive Red Data List will take several years but an excellent start has been made and a firm foundation has been laid. A fair proportion of the plants in the following list fall into the Least Concern (LC) threat category. National threat categories do not necessarily reflect the regional situation in a particular vice-county and, in consequence, the species listed below as LC are considered rare in VC63. The listing follows the recognised order given in Stace (2010). A comprehensive master RDP Inventory giving detailed recording information on all plants is held in the author's database as data are accumulated.

RDP Data gathered in 2013

Species	General Location	UK Threat Category	No of Sites/ Occurrences
Huperzia selago	High Pennine Moors	LC	3
Lycopodium clavatum	Ovenden Moor, Halifax	LC	2
Dryopteris x deweveri (D. carthusiana x D. dilatata)	Ecclesall Woods, Sheffield	NE	2
Polypodium interjectum	Various	LC	8
Vicia sylvatica	Anston Stones Wood	LC	1
Vicia lathyroides	Mosaic Reserve, Austerfield	LC	1
Prunus x fruticans (P. spinosa x P. domestica)	Anston Stones area – hedgerow	NE	1
Aphanes australis	Mosaic Reserve, Austerfield	LC	1
Parnassia palustris	Maltby Low Common	LC	1
Salix x holosericea (S. viminalis x S. cinerea)	Ogden Plantation, Halifax	NE	1
Viola tricolor ssp. tricolor	Mosaic Reserve, Austerfield	NT	1
Viola x contempta (V. tricolor x V. arvensis)	Mosaic Reserve, Austerfield	NE	1
Hypericum montanum	Anston Stones Grassland	NT	2
Hypericum montanum	Maltby Far Common	NT	1
Erophila majuscula	Lindrick Common Quarry	LC	1
Teesdalia nudicaulis	Mosaic Reserve, Austerfield	NT	1
Persicaria minor	Mosaic Reserve, Austerfield	VU	1
Rumex maritimus	Astley Lake, St. Aidans	LC	1
Minuartia verna	Roche Abbey/Norwood area	NT	1
Stellaria pallida	Mosaic Reserve, Austerfield	LC	1
Samolus valerandi	Potteric Carr	LC	2
Pyrola rotundifolia ssp. rotundifolia	Cromwell Bottom, Elland	NT	1
Hypopitys monotropa	Cromwell Bottom, Elland	EN	1
Myosotis x bollandica (M. secunda x M. stolonifera)	Skirden Clough, Halifax (first VC record)	NE	1
Myosotis stolonifera	Skirden Clough, Halifax	LC	1
Clinopodium acinos	Roche Abbey/Norwood area	LC	1
Mentha pulegium	Mosaic Reserve, Austerfield	EN	1

Carlina vulgaris	Lindrick Common Quarry	LC	1
Cirsium dissectum	Maltby Low Common	LC	1
Serratula tinctoria	Edge of Anston Stones Wood	LC	1
Hypochaeris glabra	Mosaic Reserve, Austerfield	VU	1
Filago vulgaris	Mosaic Reserve, Austerfield	NT **	1
Dipsacus pilosus	Lindrick Dale	LC	1
Dipsacus pilosus	S.E. of Hatfield	LC	1
Anthriscus caucalis	Mosaic Reserve, Austerfield	LC	1
Sison amomum	Field adjacent to Denaby Ings	LC	1
Spirodela polyrhiza	Sprotborough	LC	1
Baldellia ranunculoides	Potteric Carr	NT	1
Luronium natans	Calder & Hebble Canal, Elland	LC	1
Alisma lanceolatum	Potteric Carr – drain channel	LC	1
Alisma lanceolatum	Leeds-Liverpool Canal, Apperley Br	LC	1
Groenlandia densa	Askern area	VU	1
Epipactis phyllanthes	Cusworth Park	LC	1
Neottia nidus-avis	Woodland, Sprotborough	NT	1
Platanthera chlorantha	Maltby Far Common	NT	1
Anacamptis pyramidalis	Sprotborough	LC	1
Ophrys insectifera	Anston Stones grassland	VU	1
Ophrys insectifera	Maltby Far Common	VU	1
Eleocharis acicularis	Potteric Carr	LC	1
Carex arenaria	Mosaic Reserve, Austerfield	LC	1
Carex hostiana	Maltby Low Common	LC	1
Carex lepidocarpa	Maltby Low Common	LC	1
Carex demissa x C. hostiana	Maltby Low Common	NE	4
Carex digitata	Anston Stones Wood	LC	4
Carex digitata	Norwood, nr.Maltby	LC	1
Melica nutans	Anston Stones Wood	LC	1
Hordelymus europaeus	Anston Stones Wood	LC	1

Future Work

The RDP Project will continue during the 2014 field season and a series of organised field meetings, targeting a new range of species, will be drawn up and circulated widely during the coming weeks. This does not, however, preclude anyone from doing further recording of species listed above. The more comprehensive data we can gather, the better. In the end, hopefully, there will be a resulting document which will be of value to a range of national and local government organisations and large consultancies, as well as to academics, land managers, amateur botanists and wildlife enthusiasts.

Acknowledgements

The collection of data in a project such as this is very much a collaborative enterprise and a large number of the people who played such an integral part in the recent South Yorkshire Plant Atlas Project have again willingly come to the fore and are contributing significantly to the RDP Project. In particular I would like to sincerely thank Louise Hill, who organised and

led three outings, researching the rare species at each location - the Mosaic Reserve at Austerfield, Cusworth Park and Potteric Carr. Other key players in this exercise are Derek Bailey, Dr Kenneth Balkow, Robert Beevers, Bruce Brown, Graeme Coles, Everald Ellis, Beryl and George Griffith, Dr John Hodgson, Dr Andrew Kafel, Jill Lucas, John Scott, Jesse Tregale and Michael Wilcox. Bradford Botany Group members also participated in two of the excursions. Very many thanks to all and I hope to see you all (and others) in 2014.

References

Cheffings, C.M. & Farrell, L. (2005) *The Vascular Plant Red Data List for Great Britain.* Species Status 7 : 1-116. JNCC, Peterborough.

Preston, C.D., Pearman, D.A. & Dines, T.D. (2002) *New Atlas of the British and Irish Flora.* Oxford Univ. Press, Oxford.

Stace, C.A. (2010) *New Flora of the British Isles.* 3rd Ed. Cambridge Univ. Press. Cambridge.

Wilmore, G.T.D. (2013) A Provisional Vascular Plant Red Data List for VC63 (S.W. Yorkshire) – An Evaluation of Current Status. *The Naturalist* 138: 18-31.

Wilmore, G.T.D. (2014 in prep.) A Provisional Vascular Plant Red Data List for VC63 (S.W. Yorkshire) – Field Recording Guidelines.

Field Note: Guinea Pig in the North York Moors

Chris and Helen Pellant
email: chspellant@fatoxfarm.freeserve.co.uk

On 11 October 2013 a neighbour, Nick Hopwood, called in to show us some photos he'd just taken of a 'mystery' animal his dogs had killed near Baysdale. The location is called Hob Hole (NZ652074). This is a popular place for picnickers, walkers and illegal campers. The animal was in long vegetation beside the stream.

To us, the image seemed to show a Guinea Pig *Cavia porcellus* but, to make sure, the pictures were emailed to Colin Howes. He confirmed the identification and added the following: "Since Guinea Pigs have been popular pets for decades, if they were going to establish lasting feral populations I think we would have come across them by now. However, a 'wild' interaction is reported in the Yorkshire literature. This was of one being caught and made off with from a domestic garden in Cridling Stubbs (SE52) near Pontefract by a Tawny Owl (Johnson, 1990). A few years ago I was amazed to see a number of black Guinea Pigs grazing (free range) in a pasture on the outskirts of Pickering."

It may well be that the animal had been abandoned at Hob Hole, possibly with others.

Reference

Johnson, P. (1990) Tawny Owl taking guinea pig as prey. *YNU Bulletin* 13: 7

Field Note: A new colony of Heath Snail *Helicella itala*

David Lindley, Terry Crawford and Adrian Norris
email: david.lindley3@btinternet.com

During a recent Conchological Section field meeting to the Fridaythorpe area of the Yorkshire Wolds a visit was made to the Horse Dale and Holm Dale SSSI to the south of Fridaythorpe. This is an area of unimproved chalk grasslands with differing aspects. The Horse Dale part of the SSSI has a northwest-facing slope whilst the Holm Dale part is a southwest-facing slope. Both dales are narrow and steep-sided.

A large colony of Heath Snail *Helicella itala* was found while we were searching the Holm Dale slope (see Plate III, centre pages). The colony extends from SE88405764 at the start of Holm Dale for about 850m in a northwesterly direction. About a third of the way up the slope there has been some slippage revealing a bare scar, and it was here that the snail was most easily seen. It is clear that the colony extends some way up the slope from its base and large numbers of specimens, both adult and juvenile, were seen. This is the largest colony of Heath Snail found in Yorkshire for many years and, therefore, is of great interest and importance.

Heath Snail is a calcicole species which favours dry, open habitats and it has a patchy distribution in Yorkshire. Historically its stronghold has been on the Wolds and in coastal areas. It has also been recorded from a number of sites on the Magnesian and Corrallian Limestones and in the Dales. However, it has been estimated that over the last 50 to 60 years this snail has been lost from about 70% of known sites nationally and the same pattern is mirrored in Yorkshire. The reasons for the loss are unknown but probably relate to changing farming practices and habitat loss.

This snail has a flattish discoid shell with a very wide umbilicus, making it easily distinguishable from other species. It can grow to 25mm in diameter but is usually less. Although there is a large number of varieties its colouration is usually white to cream with a dark band following the coil. Two specimens from Holm Dale are shown on Plate III, centre pages.

The authors would be very pleased to receive any reports of sightings of this species.

The millipede *Chordeuma proximum* in Yorkshire: a new county record

A. A. Wardhaugh 13 Captain Cook's Crescent, Marton, Middlesbrough TS7 8NN

On 16 May 2013 I visited the Cliff Rigg area near Great Ayton, Northeast Yorkshire (VC62) where the ground layer was searched for invertebrates. The site is a former quarry on the Cleveland Dyke. Tholeiite (a type of basalt) was extracted from here up to about 1970, mainly for use as road stone. The Dyke is a 58-million-year-old volcanic intrusion into Jurassic strata, chiefly sandstone, and is flanked by acidic oak woodland to the northeast and southwest. These woodlands are considered to be ancient semi-natural. During the visit a leaf litter sample of about two litres in volume was collected from amid boulders at the southwest margin of the quarry site (NZ5685611827) and hand-searched for invertebrates. The litter was made up very largely of Sycamore *Acer pseudoplatanus* with some oak *Quercus x rosacea* together with a little moss and was moderately moist. Along with a number of other invertebrates four millipede species were found in the sample, these being Eyed Flat-backed Millipede *Nanogona polydesmoides,* Blunt-tailed Millipede *Cylindroiulus punctatus,* White-legged Snake Millipede *Tachypodoiulus niger* and, surprisingly, *Chordeuma proximum* (one moribund male and five fairly small juveniles).

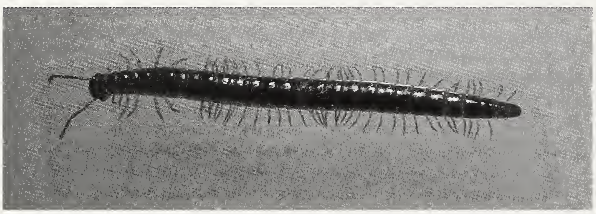


Figure 1. *Chordeuma proximum* from Cliff Rigg, NE Yorks. Length approx 11mm. The prominent 'cheeks' (cardines and stipetes) are a noticeable feature of this species.

This finding is of note because *C. proximum* has a marked southerly and westerly distribution in Britain with a few scattered records from more northwesterly sites (Lee 2006). The nearest to the present locality are Overton, Cheshire (SJ5177) and Mallsburn Woods, northwest of Carlisle, Cumberland (NY4973) (see NBN Gateway website).

On 18 August 2013 I made a visit to East Arnecliff Wood near Glaisdale, Northeast Yorkshire, approximately 23km southeast of Cliff Rigg. Leaf litter was searched in a number of areas. By chance, one site was similar to that described above, again a former quarry, albeit a small one, probably sandstone, much overgrown and within ancient semi-natural woodland (NZ789047). Various invertebrates were recorded from moderately moist Sycamore litter and moss, including the millipedes *Brachydesmus superus,* Common Flat-backed Millipede *Polydesmus angustus, Archiboreoiulus pallidus, Julus scandinavius, Allajulus nitidus* and *Chordeuma* sp. Of the last, one female and a few small juveniles were found but no male, rendering certain identification to species level not possible. The centipede *Lithobius macilentus* was also recorded at the site.

Chordeuma proximum is known to have a strong association with woodland (Lee, 2006) which makes these two records intriguing; do they represent natural or introduced

populations? Both sites lie amid ancient semi-natural woodland but they are well outside the hitherto known range of this millipede and localized disturbance in the past due to mineral extraction makes introduction a possibility. In Britain this species also has a strong association with sites less than 15km from the sea, something which is true of the two localities described above.

Of the other millipedes recorded at East Arnecliff Wood, *Allajulus nitidus* is of interest being a new record for Northeast Yorkshire (VC62). Subsequently it has been found at a second woodland site in the vice-county, adjacent to Stoupe Beck near Robin Hood's Bay (NZ95250315) on 1 September 2013. Lee (2006) describes it as widespread but uncommon and more frequently recorded from the east of Britain, a millipede of both synanthropic habitats and semi-natural woodland.

Acknowledgement

I am most grateful to Paul Lee, national and Yorkshire recorder for Diplopoda, for confirming the identification of *Chordeuma proximum* from Cliff Rigg and for reading through a draft of this article. Any errors in the text are, however, mine alone.

Reference

Lee, P., (2006) Atlas of the Millipedes (Diplopoda) of Britain and Ireland. Pensoft, Sofia-Moscow.

Cross Hills Naturalists' Society

Tom Clinton Media Officer, Cross Hills Naturalists' Society

(This account is based on an original article in the *Craven Herald*, August 2013)

- *After 109 years since its formation, Cross Hills Naturalists' Society closed its doors for the last time on 31 August, 2013. An aging and declining membership, coupled with the rapid advancement of digital communication and modern media, finally led the Society to accept the inevitable.*

In 1904 "seventeen gentlemen from Cross Hills" decided to form a group in order to learn and understand more about the natural world and encourage others to join them. Regular meetings and excursions into the surrounding countryside were organised. This provided opportunities for working people to step out of their world of work in factories or mills, etc. and into the natural world that surrounded them. This period reflected the introduction of

compulsory education for children up to ten years old by the Bradford MP William E. Forster in 1870 and, later, the Secondary Education Act. As a result, people could now widen their knowledge of the natural world by going to look and experiencing it for themselves as well as reading or being taught about it.

The outings into the country and meetings were always popular and well attended by members. The Society's records show details of train timetables that were well-thumbed and used in order to extend the members' activities further afield than Craven.

The Society soon experienced the early days of sex equality. In 1907 a Miss Edith Aldis caused an earthquake in the all-male Society by writing to seek membership. This 'bomb shell' was defused by a meeting of members who decided that *"the only two members likely to be endangered by the admission of women were the only two bachelor members"*. Records show that *"either in the spirit of hope or resignation"* these two men decided that women could become members of the Society. The Society has had 15 Presidents in its 109 year history but only two women were elected to this important role: Mrs J Brigg (1946–1950) and its current and final post holder - Jean Kendrew (1994–2013).

Several members of the Society received national recognition for their work in the field of Natural History. A few examples are given here:

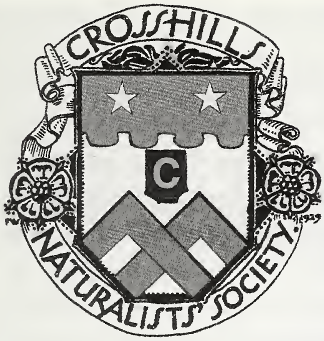
Walter Feather was a founder member and an eminent entomologist who has several moths named after him. His findings are described in a publication from the Proceedings of the Zoological Society of London in 1916.

John Holmes was the Society's Secretary for its first 23 years. In his early days he had a general interest in natural history but eventually focused on geology. His fieldwork extended to many parts of Yorkshire and on several occasions he led the Geological Section of the Yorkshire Naturalists' Union and had work published in the Yorkshire Geological Society journals. As a result of his extensive fieldwork he has a Goniatite fossil named after him – *Cravenoceros holmesii*. The genus *Cravenoceros*, which W.S. Bisat defined in 1938 to cover certain species of Goniatites, was recognised in places as far apart as the United States and North Africa within a few years. On Holmes' death his geological collection was given to Cliffe Castle Museum, Keighley.

Edward Greenwood joined the Society in 1920 and was a member for 50 years. His carefully handwritten records of his bird sightings are a monument to his ornithological skills and his fastidious record keeping. The slides he took over a long period are now lodged with the British Trust for Ornithology. All this before computers and data bases had been invented. An annual lecture was held in his memory.

Duncan Clough, a long serving member of the Society, left a legacy to it and his name was also remembered with an annual lecture.

Frank Trenouth was the longest serving President, from 1950 to 1975. He introduced the then revolutionary 35mm colour slides which enhanced the Society's visual presentations and many of the Society's procedures and have continued ever since.



The Society became one of the few societies in the region to have its own 'Coat of Arms'. A badge (see left) was designed for the Society in 1929 by Mr F Williams of the Herald's College in London following a lecture he had given to the Society in November of that year.

The Society had to survive two world wars in its first 50 years and this curtailed many of its activities. However, on 18 September 1940, the committee agreed its constitution in the President's home at 'West Bank', Main Street, Cross Hills. So, after 36 years, Cross Hills Naturalists' Society became a 'proper' society. The minutes of this historic meeting show that the first aim was *"To foster a love and appreciation of nature and to bring local naturalists and nature lovers into helpful communication with one another"*.

The Society's Microscope Group had also flourished under the long term leadership, skills and knowledge of Douglas Richardson, and produced many fascinating microscopic images.

A fortnightly Saturday evening winter programme of speakers has taken its members to many parts of the region, the UK and many other places in the world. One lecture focused on the depths of the Antarctic, revealing strange and wonderful sea life, much of it never seen by human beings before.

Cross Hills naturalists have played a key role in the restoration of lead mines in the area. The Society was deeply involved on a wide range of restoration projects including the Cononley Lead Mines, Bolton Gill Winding Shaft (Hebden Gill), Langscar Chimney at Malham and Lund's Tower (Sutton Pinnacle). The renowned Dr Arthur Raistrick played a key role in many of these activities and was instrumental in their success, so that the Society has left its physical mark on the landscape of Craven forever.

In 2004, as part of the Society's centenary celebration, it published a detailed report on its 100 years of history. In it Michael P Jackson, the Society's President from 1975 to 1994, commented *"I believe that, without wishing to denigrate that television and modern media give us much to think about, the true depth of knowledge is to be found, as far as possible, by going out into the field to experience nature at first hand"*. This appears to have been a prophetic hint about the Society's future nine years later.

The Society went on line in 2009 and launched its own web site which published details and reports of its winter and summer programmes as well as reports and images from the Microscope Group. This web site has now been archived with the British Library and can be called up as follows:-
http://www.webarchive.org.uk/ukwa/target/191037473/source/search

As the membership declined and recruitment of younger blood all but dried up it became clear that the Society could not sustain sufficient interest from the community. This dilemma grew as the natural world was beamed into people's lives by television, internet and now "smart" phones. Bad weather, particularly during the winter months, made it difficult for all members to attend the fortnightly meetings. Membership fell from 110 in 2000 to 49 in 2012/13. This unavoidable truth was confronted by a special meeting of members on 9th February, 2013 when a vote was taken as to whether the Society should continue or close after more than a century. It was a painful and difficult meeting but the vote was eventually taken to close the Society.

The Society's final field trip took place on Wednesday, 17 July 2013, with a botanical walk on Magnesian Limestone at Burton Leonard. On Thursday 22 August, a farewell afternoon tea party was held in St Peter's Church Hall, Cross Hills, its 'home' for many years.

On Saturday, 31 August 2013 the Cross Hills Naturalists' Society ceased to exist after 109 years of providing opportunities for the community to explore the natural world around them. The original fourteen gentlemen from Cross Hills would no doubt have been both proud and, perhaps, a little sad.

Ox Close Wood and the East Keswick Wildlife Trust

Melanie Smith, Greenfields, Whitegate, East Keswick, LS17 9HB.
Email: melanie@ekwt.org.uk

Much has been published recently about the dramatic declines in our countryside's wildlife. Reports from the major conservation organisations such as the RSPB, Woodland Trust and Yorkshire Wildlife Trust, all record evidence of the continuing decline in the UK's wild places. One conservation charity in Yorkshire, East Keswick Wildlife Trust (EKWT), is trying to stem these declines. Founded in 1992 to raise funds to purchase the 35-acre mixed species and part ancient woodland Ox Close, this independent, parish-based Trust has been purchasing sites and working with local landowners by encouraging management for the benefit of the flora and fauna for the last 20 years. In 1994 it took out management

agreements on Parish Council-owned landholdings comprising species-rich marsh, wetland, and a Magnesian Limestone quarry and its adjoining pasture. Since then the Trust's conservation work has gone from strength to strength.

By 1992 much of Ox Close Wood had been clear-felled (though some trees around the edges were left standing), timber from the middle of the wood had been sold and it was for sale for £25,000. A notice in the Parish Magazine asked for people to come forward to form a committee. They did and the East Keswick Wildlife Trust was formed as a charity. The money was raised quickly from local donations and grants, enabling the purchase of Ox Close Wood. It was a muddy field that soon grassed over and 20 years later it has transformed into a beautiful, naturally regenerated woodland.

I suppose that what we do in Ox Close is to replicate woodland life of a long time ago, when the area was covered by dense forest. The oldest or diseased trees would eventually fall to the forest floor, creating glades of light which would be grazed by wild animals, and clearings would form where wild flowers would bloom, the seed bank often having lain dormant for many years. In Ox Close we replicate this by opening east-to-west rides for sunlight to penetrate, creating a woodland edge habitat within the wood.

The creation of a woodland pasture within the wood was achieved through careful management and grazing during the winter months with the Trust's goats and Hebridean and Soay sheep. The loan of Dexter cattle will enhance the grazing management this winter. Unmanaged pasture becomes tussocky and unmanageable very quickly. Brambles, bracken, shrubs and trees are all 'waiting in the wings' to colonise the grassland and only cutting and/or grazing will keep them at bay. Scrub shades out the flowers and it is a constant battle to keep grassy areas open for flowers, scrubby areas for breeding birds and long grass and seed heads for invertebrates, creating a mosaic of habitats throughout the year.

Many of the flowers growing in Ox Close are indicators of ancient woodland and are uncommon outside the wood. In the spring the woodland floor is carpeted with Bluebell *Hyancinthoides non-scripta*, Yellow Archangel *Lamium galeobdolon*, Greater Stitchwort *Stellaria holostea*, Wood Anemone *Anemone nemorosa*, Ramsons *Allium ursinum*, Cowslip *Primula veris*, Primrose *Primula vulgaris* and Dog's Mercury *Mercurialis perennis*. Yellow Star-of-Bethlehem *Gagea lutea* and Herb Paris *Paris quadrifolia* also flower in good numbers (see Plate V, centre pages). Light to the woodland floor is restricted in summer as the woodland comes into leaf and the canopy closes, causing the ground flora to die back. However, on the managed woodland rides and open grazed pasture many unusual flowers survive. These include Common Spotted *Dactylorhiza fuchsii*, Early Purple *Orchis mascula* and Bee Orchids *Ophrys apifera*, St John's-worts *Hypericum* sp., Common Centaury *Centaurium erythraea*, Columbine *Aquilegia vulgaris*, knapweeds *Centaurea* sp., eyebrights *Euphrasia* sp., Autumn Gentian *Gentianella amarella* and Thistle Broomrape *Orobanche reticulata* .

Ox Close Wood is an important site for the rare Thistle Broomrape (see back cover) which, except for a few other locations in Yorkshire, is found nowhere else in the British Isles. Two years after EKWT had purchased Ox Close there was the most amazing flush of flowering spikes. The wood was identified as a major site for the plant and 787 of the 1013 spikes of this plant counted in Yorkshire were in Ox Close; good numbers are still being recorded today.

Broomrapes are unusual in that they lack chlorophyll, their leaves are reduced to scales and they parasitise other plants for food, in this case Creeping *Cirsium arvense* and Spear Thistles *C. vulgare*. It appeared that ground disturbance when the wood had been felled had resulted in the germination of dormant seed. Fire sites now produce good numbers of this parasite two years later, after thistles have colonised the area.

The flora and fauna in the wood would not flourish without the sympathetic management of the 70 acres of land managed by the Trust. Thousands of man-hours have been spent working in the wood over the last 20 years, all thanks to the Trust's weekly Friday voluntary work parties, working alongside a contractor. Tasks vary according to the time of year, as there are many conservation initiatives the Trust is pushing forwards.

Some of the thinned and coppiced wood is made into charcoal. Sold in the village shops, it brings in a good revenue to pay for more management works. On the charcoal-burning weekends the Trust runs a variety of workshops for all ages, including hurdle-making, greenwood furniture, coracle-making, willow-weaving, bushcraft and camp-fire cooking (see Plate IV, centre pages).

For the past 20 years EKWT has been working with the local communities, schools, Duke of Edinburgh students, Cubs, Scouts, Guides and Brownies, organising educational visits and events and guided walks for other natural history groups. EKWT encourages involvement and the teaching of conservation management, animal husbandry and conserving and protecting areas of wildlife-rich habitat within the parish, encouraging all, especially young people, to be involved in its local initiatives. It hopes to enthuse them to appreciate the countryside and to enjoy being in the natural environment.

In the past 12 months the Trust has raised £70,000 through local donations and grants to purchase The Ellikers, a five-acre pasture with woodland and marsh which lies partly on the Magnesian Limestone adjacent to the village of East Keswick. It has a rich diversity of associated flora. This will bring the Trust's private land holding to 40 acres.

The importance of this site lies not simply in its inherent value but also in the fact that it provides a wildlife corridor and living landscape of several acres, joining up four of the other EKWT nature reserves. It also links into the Trust's wild flower verge initiative, creating a wonderful mosaic of mixed habitats where wildlife will flourish and be protected for the future.

The Trust believes the recent reports of our country's declining wildlife should be a wake-up call. We should start our campaigns locally, doing everything we can to save what remains; we cannot afford to wait any longer.

Visit our website for more details about the Trust at www.ekwt.org.uk

Ox Close Wood - a historical background

Margaret Moseley, 8, Brooklands, East Keswick, LS17 9DD.
Email: margaret@ekwt.org.uk

Ox Close lies by the River Wharfe in a landscape that must have changed very little in the preceding centuries (Fig.1). Positioned over a mile from the village centre, it was part of the common lands of East Keswick and used as a wooded pasture until Enclosure at the beginning of the 19th century.

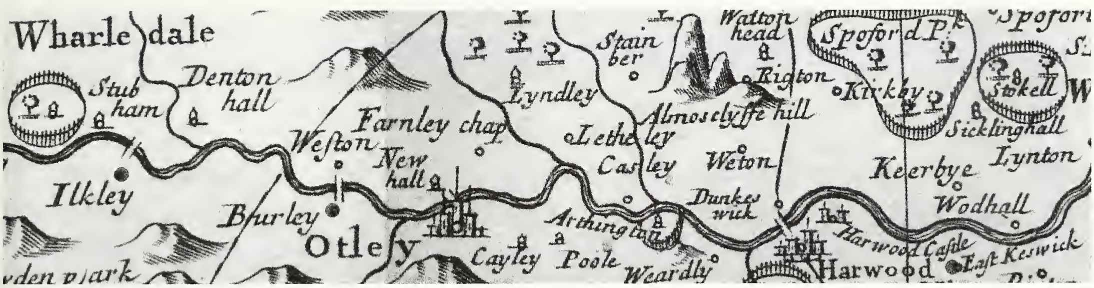


Figure 1. Detail from a map in *Vicaria Leodiensis: or the History of the Church of Leedes in Yorkshire*, Ralph Thoresby, 1724

East Keswick has an interesting geology—the western side of the parish lies on Gritstone with overlying Boulder Clay, and to the east Magnesian Limestone. This mix makes Ox Close a very diverse habitat; it has rich alluvium by the river, a central band of more acidic soil where there was once a conifer plantation and a substantial area on the limestone.

When EKWT purchased Ox Close the only evidence that this was more than a recent plantation was the surviving woodland flora. It was known that several Small-leaved Limes *Tilia cordata* grew near the river (Fig.2); these trees colonised from the south as the climate warmed after the last Ice Age, being the dominant tree in southern Britain up to the Humber by 5000BC. As temperatures subsequently cooled, it was unable to set fertile seed so ceased to spread (Pennington, 1969). The presence of this tree, also known as Pry, together with Herb Paris, another rare plant recently found in the wood, strongly indicates that this could be a remnant of ancient woodland (Rackham, 1986).


Figure 2. Small-leaved lime *Tilia cordata*

Quantities of flints have been found on the northern side of the river not far from Ox Close. These would have been brought from the Yorkshire Wolds to be knapped into tools and weapons. Therefore it is very likely that this area, with access to the river, would have been settled in the Stone Age.

With the creation of early settlements, Neolithic man must have learnt to manage woodland for his diverse needs: coppiced hazel for buildings and fencing, maiden and pollarded trees to provide timbers for large structures, fuel for cooking and warmth and a variety of woods with different properties to make tools, weapons and boats such as coracles.

There is evidence that an area of the woodland had been terraced at some time in its history. Similar terraces or lynchets are to be found 2 miles to the west at Harewood and are known to be part of early field systems We surveyed this area in 2006 but further work needs to done to investigate whether these terraces were for agriculture or created to help woodland management.

Designated areas of managed woodland must have been essential for every community and continued to be important when lands were organised into open fields and commons, possibly as early as Anglo-Saxon times. Many historic documents relating to Ox Close, also known as New Close, survive so that we know with certainty it was a Common Wood-pasture by the 16th century if not for many centuries before. It was on the township's

north-eastern boundary by the river and at that time covered about 42 acres (now only 35 acres). Rules and regulations for all the Common Lands were set down by the twice yearly Manorial Court Leet held at Harewood and swingeing fines laid down for anyone who transgressed. Only 18th century court records survive and these give us a clear indication that wood could be extracted during winter months from individual allotted areas which were marked out by 'mearstones' (in 1742 Isaac Boyle was fined 5s/6d for moving one of these marker stones).

Only Commoners were allowed to take timber from Ox Close and even they were forbidden to sell wood to anyone outside the Manor of Harewood. In 1754 Robert Teal was presented and fined ..."for felling Firking Rods in Keswick New Close & selling the same the sum of 5/-" and .."John Wright for felling Stakes & Buildings and carrying the same out of the Liberty the sum of 1/-". In 1758, 7 people were fined 3d "for cutting up wood & carrying out the same out of New Close". The parish register for Harewood gives some idea of the trades besides those of farming being carried out in East Keswick during the 17th and 18th centuries: weaver, saddletree maker, lime burner and shoemaker amongst others. All these trades would have required very specialised types of wood to make tools and copious amounts of timber would have been needed to fuel the lime burning. Besides this there were buildings to be constructed, carts and furniture of various kinds to be made. Ox Close must have been a well-stocked and managed woodland to provide for all the needs of the village.

A boundary survey of Ox Close, probably dating from the early 1700s, mentions some significant trees within the described hedge line: crabtree *Malus sylvestris*, maple *Acer campestre*, elm, hazel bush *Corylus avellana*, burtree (Elder) *Sambucus nigra*, white thorn *Crataegus monogyna* and great thorn (Anon, 1698-1817). These trees, apart from the Crab Apple, are still present in a surviving hedge which includes some large elm stumps. This survey is the only record relating to Ox Close that mentions tree species besides Hazel. As well as the Small-leaved Lime mentioned earlier, oak must have almost certainly grown here, and indeed there are some large oaks on the present western boundary.

Each year quotas for summer grazing in Ox Close were agreed by the Commoners rather than the Court. In all there were just over 100 'gates' in the wood, each entitled person would be allotted a proportion of gates depending on the size of their farm and then each individual could calculate how many animals they could put out to pasture. In 1744 an agreement, that still survives, specified type and ages of animals as well as numbers for each gate. It appears that only horses, sheep and cattle could be grazed during that year (Anon, 1698-1817). No records have been found for 'pannage'—allowing pigs to forage in the wood.

During the autumn Hazel nuts were harvested (in 1733, five people were fined 2/6 each for illegally picking nuts (Anon, 1702-1774). Ox Close would have looked much as parkland does today: cattle, horses and sheep would have browsed the trees and grazed the open glades. The areas of coppiced woodland must have been protected from the animals in some way to allow regrowth.

Centuries of village collective management ended in 1803 with the Parliamentary Enclosure of East Keswick. It is clear from a detailed survey made of the village prior to Enclosure, that the Lascelles of Harewood were determined to acquire Ox Close for its wood and for use as a fox covert. In 1798, the surveyor for Lascelles writes: "The Common Pasture or rather wood called Ox Croft [sic] is well stocked with Hazle [sic] and other wood...it appears to be a thick Underwood and would answer extremely well to be kept". It is hard to imagine just how disruptive and devastating these changes must have been to the villagers. Rights to collect wood, graze and even enter Ox Close would have disappeared overnight.

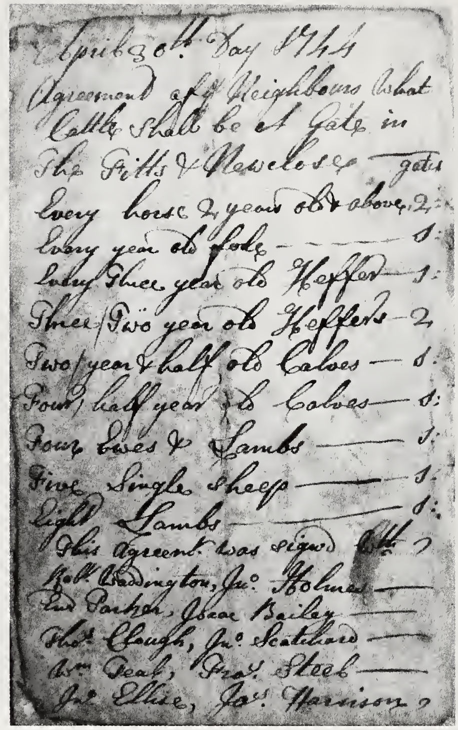

April 30th Day 1744
Agreement of ye Neighbours what
Cattle shall be A Gate in
The Pitts & Newclose — gates
Every horse 2 years old & above 2:
Every year old foale — 1:
Every Three year old Heffer — 1:
Three Two year old Heffers — 2,
Two year & half old Calves — 1:
Four half year old Calves — 1:
Four Ewes & Lambs — 1:
Five Single Sheep — 1:
Eight Lambs — 1:
This Agreement was signed by
Robt Waddington, Jno Holmes
Edw Parker, Isaac Bailey
Thos Clough, Jno Scatchard
Wm Peal, Fras Steel
Jno Ellise, Jos Harrison

Fig. 3 A grazing agreement from 1744. West Yorkshire Archive Service, Leeds WYL977.

Fittingly, after almost two centuries of private ownership, Ox Close is once more being managed as a wood-pasture by the village community.

References

Anon (1698-1817) East Keswick Township papers 1698-1817, Teal family papers, West Yorkshire Archive Service, Leeds.

Anon (1702-1774) Harewood Manorial, Harewood Court Leet & Court Baron 1702-1774, West Yorkshire Archive Service, Leeds.

Pennington, W. (1969) *The History of British Vegetation*, The English Universities Press Ltd, London.

Rackham, O. (1986) *The History of the Countryside*, J. M. Dent, London.

YNU Annual Conference 2014

Saturday 22 March at the

Royal York Hotel (next to York Station)

The theme of the Conference will be

"Museums and Nature: the Modern Perspective"

There will be a mixture of talks and workshops.

Details of speakers, timings and lunch arrangements will be placed on the YNU website at

www.ynu.org.uk/events/conference

Letter to the Editors - Scientific names

From **Ian McDonald**

On page 157 of the August 2013 edition of *The Naturalist*, there appears a letter to the editors from Dr. Elva Robinson, University of York. Elva says "Two major advantages of the scientific binomial names are that it is internationally meaningful and that it is stable over time, with changes properly documented." I could not disagree more. The scientific names of plants are anything but stable. For instance, Fen Violet has, over the years, been named as *Viola persicifolia, V. stagnina*, back to *V. persicifolia* and now back to *V. stagnina*. Another example is Yellow Sedge. Previously called *Carex demissa*, it was changed to *C. viridula* ssp. *oedocarpa*. Now it is back to *Carex demissa* again. The excuse for all this name changing is that further studies have shown that the plants actually belong to another branch of the family. Why then has another study shown that this is not so? This time wasting procedure only serves to add confusion to field botanists who are writing reports. Much more time is used to go through 'the latest' flora to see if a plant name has been changed since last Monday. In the forthcoming *Flora of Thorne Moors* I am keeping to the names in the *New Flora of the British Isles*, second edition by C. Stace, 1997. I will be stating that this is the edition used. I have already been criticised by one person for this decision but I for one am not prepared to keep buying books because 'the experts' cannot make their minds up regarding the naming of plants. Perhaps I am the only naturalist in the country with this opinion but I do not think so.

Book Review

All things Wild and Wonderful – Wildlife Imagery in Yorkshire Churches by **M. Jill Lucas** 2013. Pp156. Published by Northern Bee Books, Mytholmroyd. Available from the author at: 8, Camborne Drive, Frisby, Huddersfield, HD2 2NF: £18 + £2 p.&p.

This is a delightful book, which the author has obviously enjoyed researching and writing. In the course of thirty years of studying the subject she has visited over a thousand Yorkshire churches, and around one hundred are included in this publication.

As well as the symbolism and imagery associated with the wildlife depicted in wood, metal, stone, needlework and stained glass (see front cover), we are given a brief description of each church, its history and patron saint together with mentions of notable people with connections there in the past. There are pages of excellent photographs of artefacts dating from the 12th to the 20th century. The artistry covered is restricted to the church building itself and the internal features and fabric, so no churchyard gravestones or memorials. Nevertheless the sheer number and variety of the depictions is amazing.

The introduction gives background information on the subject and how the author became fascinated by this particular aspect of church architecture and fabric. Then we are given an alphabetical list of the churches featured in the book, followed by sections on birds, mammals, plants, other creatures, fabulous/mythical beasts and miscellaneous subjects. Each section is followed by several pages of photographs, illustrating the text. Most are arranged alphabetically, except for the images and I would have found some way of cross referencing helpful, perhaps page numbers of features/images in brackets in the list of churches given in the first section. The book closes with a useful glossary and bibliography.

There is a wealth of information on the symbolism of the plants and animals, both actual and mythical. Sources go back to Aesop, Greek myths, the Bible, the medieval bestiaries, Pagan, Islamic and Christian legend and more. Many medieval examples have a moral, such as a fox dressed in clerical vestments and often accompanied by an ape, preaching to a crowd of domestic poultry. He suddenly pounces on one of the birds, indicating the slyness of the devil, out to capture unwary souls. When carrying a hare or a goose the fox is a symbol of gluttony. Depictions of apes and monkeys are usually satirical references, often at the expense of physicians. The origin of the symbolic 'pelican-in-its-piety' is explained in detail. Crocodiles, antelopes, parrots and juniper are among the many species included in this book associated with some kind of symbolism.

This is a fascinating read and an inspiration for days out, exploring not only the thousands of churches throughout Yorkshire, but leading to a closer inspection of their man-made treasures and a deeper understanding of how our forebears looked at the world, both spiritual and temporal.

Pip Seccombe

Yorkshire Naturalists' Union Excursions in 2013

Compiled by **Albert Henderson and Adrian Norris**

GENERAL INTRODUCTION (Adrian Norris)
Owing to medical commitments and a clash of dates, I was able to attend only two of the five YNU Field Excursions. However, all of the meetings proved successful even though one of them had reduced attendance figures. Thanks are due to the various Honorary Secretaries for all their work in organising these meetings.

The weather proved to be warm and dry for all except the first event which was damp due to earlier rain. Mostly it was hot, if not too hot, with positive results for the numbers of insects recorded. The hot dry weather did, however, result in some other species being much harder to find. Such are the vagaries of our Atlantic weather systems for our wildlife heritage!

Cromwell Bottom near Brighouse (VC63) 18 May 2013
(NGR Centrum SE125224)

INTRODUCTION (Joyce Simmons)
Don Grant reports that this mature reserve has been created out of former sand and gravel workings adjacent to the River Calder and the Calder & Hebble Navigation (a canal section here). During the 1960s and 70s Elland Power Station, situated to the west of the reserve, hydraulically transported boiler ash through a pipe crossing the river to the old gravel pits. When the Elland by-pass was being constructed, the ash was dug out and used to make embankments. The result is that the soil on the reserve is a mixture of sand, gravel and boiler ash. During and since the 1990s some pits were filled with domestic refuse and they have now been landscaped and converted into green fields.

A cool drizzly start to the day greeted the 23 attendees of this meeting. We were welcomed by the volunteer team who care for the reserve and Robin Dalton from Calderdale Local Authority. Our first encounter with the area's wildlife was the heronry adjacent to the car park, now with five nests. After a cold, wet spring emergence of plants and invertebrates was delayed but molluscs were in their element!

The botanists, led by Don Grant, sought the rarities known from previous reports, but growth was limited. Orange-tip butterfly eggs and the mines of leaf-mining moths were visible, but few insects were on the wing. Those who crossed the road to investigate Elland Wood found a dazzling display of Bluebells *Hyacynthoides non-scripta* in the woodland.

The tea meeting, held in The Central Methodist Church in Brighouse, was attended by members of 15 affiliated societies and members of the local reserve group. They told us of mammal populations observed on the reserve: these included Noctule, Pipistrelle and

Daubenton's Bats, Badger and Otter. The presence of American Mink makes the survival of Water Vole here uncertain.

Management recommendations were made relating to the pond and Tag Loop. These are becoming overgrown with spindly willow and should be cleared. The woodland sites where Intermediate Wintergreen *Pyrola rotundifolia* and Yellow Bird's-nest *Monotropa hypopitys* grow also need some clearance, perhaps the removal of 50% of the tree cover, to allow light to reach the woodland floor. It was also felt that around the grassland areas encroachment of trees should be restricted. The pond has an extensive growth of the very invasive New Zealand Pigmyweed *Crassula helmsii* which covers the shore and open water and is choking out native species. It is acknowledged that this is difficult to deal with.

An *ad hoc* extra meeting was arranged at Cromwell Bottom on 17th July, which was attended by members particularly interested in the invertebrate life which was lacking on the previous meeting. The temperature was around 25ºC after a rain-free period, so the small ponds were dry. Dragonflies (Brown Hawker, Common Blue Damselfly and Large Red Damselfly) were on the wing. Day-flying moths included: Shaded Broad-bar, Clouded Magpie, Narrow Bordered 5-spot Burnet as well as Cinnabar moth larvae. Scarce plants such as Broad Helleborine *Epipactis helleborine* , Twayblade *Listera ovata*, Yellow Bird's-nest (see Plate VI, centre pages) and Intermediate Wintergreen were all found.

Again, members of Cromwell Bottom Local Nature Reserve Group accompanied YNU members, and we are very grateful to them for their help and expertise in facilitating our visits.

MOLLUSCS (David Lindley)

The wet weather on the day of the Excursion produced a great number of individual specimens and 12 freshwater and 24 land molluscs were found, three of them new to the reserve. Copse Snail *Arianta arbustorum* was found mainly where the canal borders the reserve; it was, however, also found on the southern edge. Brown-lipped Snail *Cepaea nemoralis* was found in a number of areas; previously only White-lipped Snail *C. hortensis* had been found. The most interesting new addition was Girdled Snail *Hygromia cinctella*, a single specimen from near the road bridge at the entrance to the reserve. It was introduced into the country early last century and was initially confined to the extreme south west. In recent years there has been a dramatic expansion of its range.

It is worth mentioning that Shiny Glass Snail *Zonitoides nitidus* was found in numbers at the edge of one of the small scrapes. Although widespread it can be very local in nature and would not be classed as common in the area. The majority of freshwater species were from the canal but it was interesting to find some fine specimens of Porous Pea Mussel *Pisidium obtusale* in the large lagoon.

INSECTS - Parasitic Hymenoptera (Bill Ely)

Seven ichneumons and two parasitic cynipoids were collected and all are new to the site list. The campoplegine ichneumon *Alcima orbitale* (fourth Yorkshire record) and the orthocentrine ichneumon *Helictes erythrostoma* were found in Tag Loop and both are new to West Yorkshire.

PLANT GALLS (Tom Higginbottom)

Alder *Alnus glutinosa* leaves in the car park were covered in the small white pimples of the gall mite *Eriophyes laevis*. After searching amongst the Hazel *Corylus avellana*, the big-bud mite gall *Phytoptus avellanae* was discovered. Some of the Rowan *Sorbus aucuparia* leaves were covered in white pustules caused by another mite, *Eriophyes pyri*. A number of the male catkins of Goat Willow *Salix caprea* were distorted forming hard woody lumps, probably caused by a virus. On oak catkins and leaves the Currant Gall, the sexual generation of the gall wasp *Neuroterus quercusbaccarum*, was quite common. There were also the previous year's remains of other wasp galls: the Artichoke Gall *Andricus foecundatrix*, the Marble Gall *A. kollari* and the Cola-nut Gall *A. lignicolus*. On Dog Rose *Rosa canina* there were also old examples of another gall wasp *Diplolepis rosae*, which forms the Robin's Pin-cushion.

On the underside of the leaves of Lime *Tilea x europaea* trees in the hedgerow beside the A6025, the erineum of the mite *Eriophyes leisoma* was quite common. The edge of some leaves had been rolled downwards by another mite, *Phytoptus tetratrichus*. In Elland Wood whitish pimples were found on the leaves of Common Whitebeam caused by the mite, *Eriophyes arianus*. The edge of some Beech *Fagus sylvatica* leaves had been tightly rolled by yet another mite, *Acalitus stenaspis*.

FLOWERING PLANTS (Don Grant)

The rarest plants on the reserve are Yellow Birds-nest and Intermediate or Round-leaved Wintergreen. There are several orchids known from the site. Two species lost from the site due to tree and reed encroachment are Creeping Willow *Salix repens* and Needle Spike-rush *Eleocharis acicularis*.

By the river are large stands of Sweet Cicely *Myrrhis odorata* and Japanese Knotweed *Polygonum cuspidatum* together with Common Bistort *P. bistorta*. In the woodland edges there were Pendulous Sedge *Carex pendula* and Yellow Archangel *Lamiastrum galeobdolon*. A single plant of Hard Shield-fern *Polystichum aculeatum* was found here. Stonework by the canal lock had Common Whitlow-grass *Erophila verna* and Black Spleenwort *Asplenium adiantum-nigrum*. A member of Halifax Field Naturalists' reported that another adult plant and several seedlings of the Soft Shield-fern *P. setiferum* had been found in Elland Park Woods. Due to the increase in boating on the canal, it looks as if Floating Water Plantain *Luronium natans* and Narrow-leaved Water-plantain *Alisma lanceolatum* have died out, but fortunately a small colony of Arrowhead *Sagittaria sagittifolia* is still existing by the road bridge over the canal. With the cold and prolonged spring many plants were not in flower.

MOSSES and LIVERWORTS (Tom Blockeel)

The most productive habitats for bryophytes were on the floor of the secondary woodland on the old fly-ash tip, and on the bark of the trees themselves. Robust mosses occurring on the ground in the woodland included *Eurhynchium striatum*, *Rhytidiadelphus loreus*, *R. triquetrus* and *Thuidium tamariscinum*. The two *Rhytidiadelphus* species are particularly notable, as they were very rarely recorded during the 20th century in SW Yorkshire. Secondary woodland on post-industrial sites has proved to be an interesting habitat for them, even though they are rare or absent in established woodland in the vicinity. It seems that the raw substrate on old pits and waste offers fertile ground for their establishment, and it is notable that they do not generally occur in new woodland planted on grassland sites.

The epiphytic flora of the trees proved to be rather rich and astonishingly included a tuft of *Ulota calvescens* on the branch of a sallow. During 2013 it has become apparent that this moss is widespread in the southern Pennines, though never previously recorded there. It was thought to be a species of strongly oceanic distribution, being known only from western Scotland and western Ireland, and a few sites in Wales and SW England. Like the tiny liverwort *Colura calyptrifolia* it is evidently extending its range eastwards. Other epiphytic species, mostly present in small quantity, included *Cryphaea heteromalla*, *Frullania dilatata*, *Metzgeria violacea*, *Orthotrichum lyellii*, *O. pulchellum*, *O. stramineum*, *O. tenellum*, *Radula complanata* and *Ulota phyllantha*. A patch of *Leskea polycarpa*, a species characteristic of the flood zone of lowland rivers, was found on Sycamore *Acer pseudoplatanus* on the river bank.

The area of wet acid ground at the eastern end of the reserve has an area of *Sphagnum* mire (with *S. squarrosum* and *S. fimbriatum*). Associated mosses included *Aulacomnium palustre*, *Calliergon cordifolium* and *Polytrichum commune*. The *Aulacomnium* included some shoots with vegetative propagules on elongate shoot apices ('pseudopodia'). These are well-known on the related *A. androgynum* but are rare in *A. palustre*.

The list of species was augmented in ruderal habitats around the periphery of the reserve. Both *Orthotrichum anomalum* and *O. cupulatum* were very fine on a concrete wall-top. *Didymodon acutus* unexpectedly occurred on a gravelly path. This is a rare species of open calcareous ground that appears to be spreading in weedy places.

APPENDIX – Elland Park Wood (Roy Crossley)

The wet conditions throughout the day precluded any fly-collecting, so I took the opportunity to go for a trip down memory lane and visit Elland Park Wood. It is more than seventy years since I played in the wood and it was one of the places that fired my first interests in natural history. Here, when children, we collected bunches of Bluebells *Hyacinthoides non-scripta* to take home for our mothers, hunted for bird nests, and later in the year built dens out of Bracken *Pteridium aquilinum*. And both we and the Bluebells live to tell the tales!

Entering the wood from Plains Lane the small valley on the left was a blaze of colour, dominated by Bluebells, but conspicuously dotted here and there with the flowers of Yellow Archangel which are always a joy to see, especially for an East Riding resident! The other common woodland spring species were seen in varying degrees of abundance, the only absentee being the Primrose *Primula vulgaris*, which I doubt has ever occurred in the wood, at least not in my lifetime.

It was good to see that Bluebells still carpet huge stretches of hillside – for this spectacle alone the wood is surely one of the natural history gems of Calderdale! But the upper slopes at the Elland end have been much damaged, presumably by scrambling bikes, with evidence of such activity throughout the wood in spite of prohibitory notices. Also, although not a major problem, it was disappointing to see evidence of fly-tipping and litter in places. There seemed to be a lot of new Holly *Ilex aquifolium* growth on the damaged area of hillside, and I also got the impression that Brambles *Rubus* sp. were taking over from Bracken on some of the Bluebell slopes. The well-known stand of Pendulous Sedge *Carex pendula* in the upper boggy areas looked spectacular, with many male spikes flowering profusely.

In spite of the rain, this diversion was well worth taking, and it is a pity that lack of time (and parking difficulties) meant that others were not able to enjoy the delights of this lovely old wood.

Grassington, Grass and Bastow Woods (VC 64) 8 June 2013.
(NGR SD9865 &SD9965)

INTRODUCTION (Terry Whitaker and John Newbould)
Members representing 11 affiliated societies surveyed Grass Wood SSSI, Bastow Wood SSSI and Lea Green, part of Conistone Old Pasture SSSI, across an area ranging from the River Wharfe, at an elevation of 190m in the west, to the upper slopes of Conistone Old Pasture, at around 300m in the east. Long walled fields overlie a Celtic field system tapering southwards via the Romano-British hamlet of Lea Green, abandoned after the Romans left Britain. Conistone Old Pasture and Lea Green lie on a bench of Carboniferous Limestone with outcropping limestone pavements extending into Bastow Wood. The area is considered to be of national physiographic importance with large but little-fractured inclined slabs, especially at the southern end.

Grass Wood is a botanically rich Ash woodland occupying an area of Carboniferous Limestone, west of Grassington. The wood measures 88ha and is now managed by the YWT. Many ancient woodland indicator plants are present in the ground cover along with

local rarities such as Angular Solomon's-seal *Polygonatum odoratum*, Lady's-slipper *Cypripedium calceolus* and Bird's-nest Orchid *Neottia nidus-avis*. The conifers and non-native hardwood plantings are gradually being removed and regular coppicing has been re-introduced. Bastow Wood, to the north and east of a major boundary wall, is sadly essentially unmanaged. It consists of scrub birch woodland set in rank Blue Moor-grass *Sesleria caerulea* with abandoned ash-hazel coppice to the south-east. Both areas are noted for their fauna. There are notable records of invertebrates including Northern Brown Argus and other Lepidoptera, such as Cistus Forester, Barred Tooth-striped moth, Barred Carpet and Least Minor.

The cold winter and long cool spring gave way to summery weather just in time for the meeting, but the emergence of most insects proved very late. Moth trapping on the Friday night was favoured by a calm mild night and the large catches of the many moth traps reflected this. The next day dawned warm and sunny and featured the first sightings, for the year, of many species.

Lunch was taken on the cairn, just east of Bastow Wood. In the afternoon the Reports meeting, with tea and biscuits, took place in the Devonshire Institute. The President thanked the Yorkshire Wildlife Trust for permission to visit Grass Wood, The Fountains Trust for access to Bastow Wood and the Woodland Trust for access to Lower Grass Wood and the River Wharfe.

MAMMALS and other vertebrates (John Newbould)

At the meeting members reported seeing Rabbit, a dead Hedgehog on Grass Wood Road to the northwest of Grass Wood, Roe Deer in Bastow Wood, Field Mouse and numerous Mole hills on Lea Green. No reptiles or amphibians were reported but Mrs Sharon Flint reported finding Bullhead (*Cottus gobio*) from the Wharfe and a native crayfish part-eaten possibly by an Otter.

BIRDS (John Newbould)

No member undertook a formal bird survey. Dipper was reported from the Wharfe; Blackcap, Willow Warbler and Green Woodpecker (calling) from within Grass Wood. In Bastow Wood, Chaffinch, a pair of Meadow Pipits and a Song Thrush were seen, whilst Curlew was calling from the moor to the east. Swallows were seen most of the day on open fields. As we left the tea meeting in Grassington, Lapwings were calling

INSECTS - Moths (Charles Fletcher)

The YNU lepidoptera group was invited to set up moth traps on the Friday night. A total of 15 traps were set up: 11 MV and 4 actinic. The night was comparatively warm and there was a good catch of typical moths associated with upland woodland and a total of 77 species recorded.

Micromoths are somewhat under-recorded at Grass Wood and although there were comparatively few species seen, these included several new to the site including *Coleophora otidipennella. Caloptilia robustella, Elachista apicipunctella, Capua vulgana* and *Epinotia tetraquetrana*. Macromoths included many species which are scarce on the lower ground such as the large numbers of Lunar Thorn *Selenia lunularia*. This species has virtually disappeared from lowland Yorkshire and is now quite local. Common Lutestring *Ochropacha duplaris*, Broken-barred Carpet *Electrophaes corylata* and Barred Umber *Plagodis pulveraria* also appeared in every trap and were some of the commonest species present. Juniper Pug *Eupithecia pusillata* and Coronet *Craniophora ligustri* were both on the wing very early in what was generally a late year due to the cold spring. Other notable ones included Beautiful Carpet *Mesoleuca albicillata*, Green Silver-lines *Pseudoips prasinana,* Seraphim *Lobophora halterata* and Alder Moth *Acronicta alni.*

Many additional species were seen by day on the Saturday. Larvae of Barred Tooth-striped *Trichopteryx polycommata* were found on Wild Privet *Ligustrum vulgare*. In Bastow wood the attractive day-flying *Pancalia leuwenhoekella* was seen over the grassland along with Speckled Yellow *Pseudopanthera macularia*, Mother Shipton *Callistege mi* and Cistus Forester *Adscita geryon,* all flying in the sunshine on what was a very productive outing.

INSECTS - Parasitic Hymenoptera (Bill Ely)

Light traps operated overnight caught some ichneumons and others were collected by Bill Ely & Tony Hunter, a visiting entomologist from National Museums Liverpool, all in Roadside Wood. Thirteen of the ichneumons were additions to the reserve list, with the total now 36. All seven proctotrupoids collected are additions to the reserve list, with that total now 15. The ichneumon *Stilbops limneriaeformis* was in one of the light traps and is **new to Yorkshire** and seems to be new to England as the previous records are from Ireland and Scotland. The ichneumon *Cylloceria melancholica* is the 9th Yorkshire record, the first for a quarter of a century and the first in VC64. The diapriids *Spilomicrus bipunctatus* (4th Yorkshire record) and *Spilomicrus integer* (5th Yorkshire record) are also new to VC64. These are all new to the YDNP, as are the cryptine ichneumon *Mesoleptus vigilatorius*, the campoplegine ichneumon *Dusona bicoloripes*, the tersilochine ichneumon *Phrudus defectus*, the ichneumonine *Homotherus varipes* and the proctotrupids *Disogmus areolator, Phaneroserphus calcar* and *Cryptoserphus aculeator.*

INSECTS - Diptera (Andrew Grayson)

The most noteworthy examples occurred within the main part of Grass Wood which was dissected by paths and contained several small glades. The local hoverfly *Portevinia maculata* occurred around its food-plant Ramsons *Allium ursinum* near the road at the lower part of Grass Wood. A reasonable quantity of decaying and dead wood and their surrounds provided suitable habitat for the local hoverflies *Criorhina berberina, Ferdinandea cuprea* and *Xylota jakutorum*, plus the Common Awl-fly [Xylophagidae] *Xylophagus ater.* Another local species was the marsh-fly *Pherbellia dubia*.

PLANT GALLS (John Newbould)

Just two galls were noted on the day. In Bastow Wood two of the Silver Birch had the witches' broom *Taphrina betulina* whilst in Grass Wood Bird Cherry had the red pustules of *Phyllocoptes eupadi.*

FLOWERING PLANTS (John Newbould)

Grass Wood is dissected by paths and contains several small glades. The canopy is not dense, allowing Bluebell to dominate the ground flora. There were numerous coppice stools of Hazel *Corylus avellana* and occasional Wych Elm *Ulmus glabra* in the Ash-Rowan-Dog's Mercury NVC W9 vegetation community. Bird Cherry *Prunus padus* was distinctive by its flowers. By the path a patch of Herb Paris *Paris quadrifolia* and Lily-of-the-valley *Convallaria majalis* were noted, as were also four plants of Columbine *Aquilegia vulgaris* alongside a public footpath. However, two of the four plants were pink (some recorders rejecting such a record as a garden escape).

Bastow Wood is one of those rare wood pastures found in the Yorkshire Dales. Birch *Betula pendula* is frequent with many young trees invading the grassland. Ash *Fraxinus excelsior*, abundant Hazel, Sycamore, Rowan *Sorbus aucuparia*, with rare Bird Cherry, Blackthorn *Prunus spinosa* and Hawthorn *Crataegus monogyna* from scattered NVC W9 woodland amongst the areas of limestone outcrop and pavement. Woodland ground flora noted here included Dog's Mercury *Mercurialis perennis,* Wood Anemone *Anemone nemorosa*, Crosswort *Cruciata laevipes* and Wood Violet *Viola riviniana.* The grassland (as in the adjacent Lea Common) is composed of the Blue Moor-grass - Limestone Bedstraw *Galium sterneri* community NVC **CG9.** Here Mountain Pansy *Viola lutea,* Bird's-eye Primrose *Primula farinosa* (at SE9910 6596) occasional Cowslips *P. veris* with Primrose *P. vulgaris* and Wild Thyme *Thymus polytrichus*, noted on ant hills, were components of the grassland community.

The survey of Conistone Old Pasture SSSI (Lea Green) was limited to a small area east of Bastow Wood, Here outcrops of limestone pavement were interspersed with locally dominant tufts of Blue Moor-grass. Of particular beauty were the bright yellow splashes of colour on tufts of Mountain Pansy. There will be more to come, as Common Rock-rose *Helianthemum nummularium* and Bird's-foot-trefoil *Lotus corniculatus* were only just starting to flower. Bugle *Ajuga repens*, Crosswort, Great Burnet *Sanguisorba officinalis* added to the wild flower mix. There were a few spikes of Early Purple Orchid *Orchis mascula* and a single area of Spring Sandwort *Minuartia verna* Alpine Tormentil *Potentilla crantzii* added to the delights. Both Ash and Hawthorn were scarce on the cattle-grazed Upper Calmerian grassland.

Nosterfield NR (VC65) 6 July 2013
(NGR Centrum SE278795)

INTRODUCTION (Terry Whitaker)
Nosterfield Nature Reserve lies close to the River Ure and is a former sand and gravel quarry, over Magnesian Limestone. It was Hambleton District's first LNR, designated in 2001, and started to draw birdwatchers by the early 1980s, as quarrying reached the water table and began to attract birds. In total the reserve is a little over 60ha managed by the Lower Ure Conservation Trust. It is predominantly grazed grassland bounded by extensive large hedges and adjoining two significant permanent water bodies and two smaller former silt lagoons. It is now generally recognised as North Yorkshire's premier wetland grassland site for birds, managed mainly for breeding and wintering waders and waterfowl. In total over 225 full bird species have been recorded. However it also has many uncommon invertebrates associated with a wide variety of limnological habitats.

The grazed areas are principally managed with breeding Redshank in mind and as this species dislikes the presence of livestock, they are largely ungrazed until after a hay crop is removed in mid-July. The taking of haylage for over ten years has assisted in nutrient reduction and extensive stands of Yellow-rattle *Rhinathus minor* have become established, together with an increasing botanical diversity.

Botanically the site is probably most notable for its draw-down zone species, such as Mudwort *Limosella aquatica* and those thriving on thinner gravelly soils, such as Blue Fleabane *Erigeron acris* (see Plate VII, centre pages). However, the wider species-rich grasslands are well established, with impressive drifts of eyebrights and Bird's-foot-trefoil. The site now also supports seven species of orchids.

The first warm weather of what was to prove to be a good summer had arrived and the calm and relatively warm overnight temperatures rewarded the moth-trappers. The Saturday dawned clear and soon became very hot. Whilst the moth group emptied their traps (it took over 5 hours), other YNU groups fanned out over the extensive reserve, largely ignoring the birds (including breeding Avocets) but looking at the botany and sampling the ponds. A malaise trap yielded a huge catch of a variety of insect groups for later examination.

Tea and home made cakes were served at the reserve interpretation building where the group retreated from the heat and the reports meeting started.

Thanks to the Lower Ure Conservation Trust and especially Simon and Jill Warwick for making this visit so successful.

BIRDS (Steve Worwood)
A hot sunny day produced little evidence of early return passage except for a Yellow Wagtail flying over and calling. Of the 65 species recorded for the day most were residents of the reserve or the immediate area. Evidence of breeding success was found with broods of ten young Gadwall and a similar number of Shoveler; the Tufted Duck brood of seven small young was the first for the year on the reserve. Two young Curlew of about ten to twelve days old, feeding close below the main hide attracted the attention of many observers. Sitting Ringed and Little Ringed Plovers were found on the shingle Islands along with a late pair of Avocets with four young about four days old on the North Lake. Of the ten Redshank located most were just-fledged juveniles. Four Grey Heron were catching sticklebacks in the shallows of the reserve lakes. Breeding warblers, including Sedge Warbler, Whitethroat, Blackcap, Willow Warbler and Chiffchaff were located in the hedges and scrub around the edge of the reserve. Two Marsh Tits were in the same area and a Reed Bunting was issuing its plaintive song from the Silt Lagoon scrub. Two Common Buzzards were thermalling over the West Ridge, but the bird highlight of an enjoyable day was a Hobby flying east over the Silt Lagoons in the afternoon.

MOLLUSCS (Adrian Norris)
Terry Whitaker, John Newbould and AN visited the Nosterfield Quarry Nature Reserve in SE2789, to the north of the main reserve, and recorded only six waste ground species as the day was very dry and hot.

Work on the Molluscan Fauna of Nosterfield Nature Reserve was undertaken by Dr Terry Crawford (TJC), David Lindley (DL) and AN in both SE2879 and SE2779, which includes most of the lakes. A survey of the water bodies produced a small number of records including the rare Smooth Ramshorn *Gyraulus laevis* at SE277795. DL also found this at other sites within the reserve. 75 records of some 29 molluscs from SE2779 and 18 from SE2879, bring the total number for the reserve to 32 species.

On the day of the meeting Jill Warwick produced a small sample of slugs found within the reserve; two examples proved to be Durham Slug *Arion flagellus*, not previously found by us and adding to the reserve total.

INSECTS - Moths (Charles Fletcher)
The YNU lepidoptera group was invited to trap on the Friday night and a total of 11 MV traps was set up in a variety of habitats (see Plate VII, centre pages). The night was warm and promising and when the traps were opened on the sunny Saturday morning a total of 151 species was logged including 17 new to the reserve. *Elachista luticomella* and *Epinotia rubiginosana* were both new for VC65 whilst *Elachista triatomea* was the first record in VC65 since Porritt's lists. Larvae of the two *Elachista* species feed on various grasses whilst

the *E. rubiginosana* must have strayed from some nearby Scots Pine *Pins sylvestris*. A good variety of micromoths included *Coleophora discordella, Acleris bergmanniana, Epinotia abbreviana* and *Teleiodes vulgella*, all new for the reserve. Amongst the macrolepidoptera, new species for Nosterfield included Puss Moth *Cerura vinula* and Currant Pug *Eupithecia assimilata*. Species typical of open grassy areas, such as Heart and Club *Agrotis clavis*, Shoulder-striped Wainscot *Mythimna comma* and Brown-line Bright-eye *M. conigera* were present in good numbers. Other notable species included Sallow Kitten *Furcula furcula* and Small Clouded Brindle *Apamea unanimis*.

Several more species were found during Saturday. *Dichrorampha aeratana* was swept from Ox-eye Daisy *Leucanthemum vulgare* and this proved to be another new species for VC65. A larva of Dusky Sallow *Eremobia ochroleuca* was swept from grasses and a single Narrow-bordered Five-spot Burnet *Zygaena lonicerae* was the first for the year for most observers.

INSECTS - Parasitic Hymenoptera (Bill Ely)

Light traps operated overnight caught some ichneumons and others were collected by WAE and Jonny Fisk. 10 of the ichneumons are additions to the reserve list, with the total now 33 species. Five of them are new to VC65: the cryptine *Aritranis director* collected at the Field Centre by JF, the pimpline *Scambus signatus* and the ichneumonine *Stenichneumon culpator* collected at Henge Hedge by WAE and the tryphonine *Tryphon (Symboethus) bidentatus* and the campoplegine *Diadegma erucator* collected at Keith's Field by WAE.

INSECTS - Odonata (Steve Worwood)

The hot sunny weather was excellent for the appearance of Odonata, and reasonable numbers were seen of typical species for the time of year. In excess of 30 Four-spotted Chasers *Libellula quadrimaculata* were hunting over the reserve's water bodies, with eight freshly emerged Black-tailed Skimmers *Orthetrum cancellatum*. Seven male Emperor Dragonflies *Anax imperator* were also defending territorial stretches of lake shore. Of their smaller brethren, more than 100 Common Blue Damselflies *Enallagma cyathigerum* were out over the lakes and vegetation together with a smaller number of Blue-tailed Damselflies *Ischnura elegans*. A lone Banded Demoiselle *Calopteryx splendens* was also reported.

PLANT GALLS (John Newbould)

On a previous visit in 2012 to the Lower Ure and Swale Conservation Trust reserve at Nosterfield LNR 29 species of plant gall were recorded. So it was decided to survey towards Thornborough Henges and the East Tanfield area. This resulted in a further 16 gall records, mainly found in the hedges along a public bridleway. In the afternoon session, the visit to Nosterfield Quarry resulted in a further 11 records.

Of particular note was the fungal gall *Puccinia coronata* on Purging Buckthorn *Rhamnus catharticus* from Nosterfield LNR and teh midge gall *Harmandiola pustulans* on Aspen *Populus tremula* from the west side of Nosterfield Quarry. On the track to East Tanfield it was a pleasure to see the gall Andricus *curvator* on Pedunculate Oak *Quercus robur*. During

the walk to the Henges it was a surprise to record teh aphid gall *Eriosoma patchiae* and teh mite gall *Aceria campestricola* on Wych Elm *Ulmus glabra*, not a single gall having been recorded on elm in Swaledale during the time spent there earlier in the week.

A visit later in the season would doubtless add more records to squares SE2779, SE2879 and SE2780.

FLOWERING PLANTS (Don Grant)
This worked-out gravel pit contains many types of rock including Magnesian Limestone, which allows lime-loving plants to flourish in certain areas. The site has several orchids, most notably the Northern Marsh Orchid *Dactylorhiza purpurella*.

The reserve publishes a comprehensive list of plants found and in this meeting we were able to add four new ones to it: Spiked Sedge *Carex spicata*, a rare species of grassy places; the Elm-leaved Bramble *Rubus ulmifolius,* a species from Southern England that uses the Magnesium Limestone to reach into Yorkshire; and also *R. warrenii* and *R.echinatoides*.

APPENDIX - Thornborough Henges (John Newbould)
The Union last visited this area in May 1972. With a small group desiring to see the Thornborough Henges and the old quarry, we initially walked down a green lane lined with old hedges, which had been spared quarrying, with many Pedunculate Oak *Quercus robur,* Hawthorn *Crataegus monogyna,* old coppice Ash *Fraxinus excelsior* stools together with Blackthorn *Prunus spinosa* and an occasional Wych Elm *Ulmus glabra* and Field Maple *Acer campestre*.

The old quarry area was dry grassland in a bowl some 2 metres deep down shallow banks. There was evidence of sandy soils with Common Storksbill *Erodium cicutarium* but also of an underlying calcareous influence with Dropwort *Filipendula vulgaris,* two spikes of Bee Orchid *Ophrys apifera*, Mouse-ear-hawkweed *Pilosella officinarum,* a large area of Glaucous Sedge *Carex flacca* and Salad Burnet *Poterium sanguisorba*. There was a distinct impression that the area had been altered in the past but is currently naturally returning to calcareous grassland.

We were unable to visit the Henges as the landowner had treated the area with chemicals to deter Rabbits and Moles from further damaging these very old and important historical monuments. However, a nearby public right of way produced 20 grassland and hedgerow molluscs, including Common Whorl Snail *Vertigo pygmaea* and Excentric Glass Snail *Vallonia excentrica*. In the afternoon the group split up with David Lindley firstly re-examining the freshwater snails we noted as part of our original survey and then moving on to examine the churchyard in the village of Well (SE2780) where he recorded 15 species.

Danes Dyke, Flamborough (VC61) 20 July 2013
(NGR Centrum TA215694)

INTRODUCTION (Sarah White)
This Excursion coincided with a heatwave, but thankfully the coast enjoyed a cool cloudy day making very comfortable conditions for recording. The Excursion started early with a group from the Marine and Coastal section gathering at 8.30am to survey the beach at Low Tide, while the rest of the group, totalling 11 members representing nine affiliated societies, had a rather more leisurely start. Entomological highlights were a stiltbug *Metatropis rufescens* and a parasitic wasp new to the vice county while the botanists' finds of the day were Bristle Club-rush *Isolepis setacea* and Oval Sedge *Carex leporina* which were both new hectad records. A somewhat surprising sight was a Ringlet butterfly mating with a Meadow Brown. The tea and meeting were held adjacent to the café, thanks to Val at Thornwick Bay Café. East Riding Council, who owns the reserve, were also thanked for their help with the visit and congratulated on their reserve management. We were particularly pleased to note that there was a lot of dead wood in the woodland area, as well as well-maintained paths; it was felt there would be benefit in extending the area of short turf on the cliff-top, if this was possible.

MAMMALS (Sarah White)
A dead Common Shrew was found and molehills were noted.

BIRDS (Ken White)
This is inevitably a quiet time of year for birds but the mix of habitats including woodland, cliff and shore gave a respectable list of 31 species. In the woodland Robin, Song Thrush, Blackbird, Blackcap, Wren, Woodpigeon, Stock Dove and Chiffchaff were still singing and breeding was confirmed for Robin, Blue Tit, Wren and Carrion Crow. On the cliff top Meadow Pipit, Whitethroat, Linnet and Bullfinch were seen and Yellowhammers were feeding young. Birds on the shore and flying around the cliffs included Kittiwake, Fulmar and Oystercatcher.

INSECTS - Butterflies and Moths (Paul Simmons)
The cloudy conditions were unfavourable for the appearance of butterflies, but a number of species were sighted. Of particular note were the large numbers of Small Skippers feeding on Knapweed *Centaurea nigra* between the cliff-top path and the golf course (see Plate VI, centre pages). Large Skipper, Red Admiral, Small Tortoiseshell, Meadow Brown, Speckled Wood, Gatekeeper and Ringlet were also seen, though in small numbers.

There was a greater variety of day-flying moths. Macros included Narrow-bordered 5-spot Burnet, Latticed Heath, Silver Y and Barred Straw, as well as a Cinnabar larva. A good number of micromoths were also visible. These included the grass moths *Agriphila straminella* and *Crambus perlella* in good numbers, *Udea lutealis*, *Pseudargyrotoza conwagana*, Timothy Tortrix *Aphelia paleana*, Yarrow Plume *Gillmeria pallidactyla*, Nettle-tap *Anthophila fabriciana*, and the Horse-chestnut Leaf-miner *Cameraria ohridella*.

INSECTS - Parasitic Hymenoptera (Bill Ely)
Seventeen ichneumons, one parasitic cynipoid and two proctotrupoids were collected. The diapriid *Aneurhynchus nodicornis* is new to VC61, the eighth Yorkshire site (tenth record). The orthocentrine ichneumon *Plectiscidea canaliculata* is the fifth Yorkshire record and the previous one for VC61 was at the same site in 2011. There are two previous records of the ichneumon *Oxytorus luridator* in VC61 and both are in the York area at the western end of the vice-county. The ichneumonine *Homotherus varipes* and the diapriid *Aneurhynchus galesiformis* are both second VC61 records. The ichneumon totals for both squares covered by this site have now reached 20.

INSECTS - Hemiptera (Bill Ely)
The stiltbug *Metatropis rufescens* is new to VC61 and is associated with Enchanter's-nightshade, on which it was found at this site. It was first found in Yorkshire in VC63 in 2010 and is now known from several woods there. This is the first Yorkshire record outside VC63.

FLOWERING PLANTS (Richard Middleton)
The botanists focused their attention on the monad TA2169, which contains the grounds of the now-demolished Danes Dyke House, straying only a hundred metres eastwards to Hartendale Outfall. Although the site has been reasonably well visited in the past, it was useful to be able to make a concentrated recording effort, which was rewarded with a list of over 170 taxa. The deep wooded ravine showed evidence of a long-established woodland cover with Primrose *Primula vulgaris*, Enchanter's-nightshade *Circaea lutetiana*, Salad Burnet *Poterium sanguisorba*, Sanicle *Sanicula europaea*, Ramsons *Allium ursinum,* Bluebell *Hyacinthoides non-scripta*, Wood-sedge *Carex sylvatica* and Wood Millet *Milium effusum*. This lower end of Danes Dyke was richly furnished with ferns including abundant well grown clumps of Hart's-tongue *Asplenium scolopendrium*, a plant more commonly encountered in the vice-county as stunted growths on urban walls. However, some caution may be need in the interpretation of the ferns as there may have been deliberate introductions made in the 1870s when the area was landscaped and planted with exotic trees. The Hard Shield-fern *Polystichum aculeatum*, which has one of its few VC61 stations here is almost certainly native, also occurring nearby at South Landing, but a magnificent tussock of the locally rare Scaly Male-fern *Dryopteris affinis agg.* is more problematical. Other relics of this planting period probably include Welsh Poppy *Meconopsis cambrica* and Londonpride *Saxifraga x urbium*.

There is chalky element to the flora, as would be expected, but this was found to be now largely restricted to the cliff faces, edges and their gullies. Here Kidney Vetch *Anthyllis vulneraria*, Greater Knapweed *Centaurea scabiosa,* Field Scabious *Knautia arvensis*, Carrot *Daucus carota*, Carline Thistle *Carlina vulgaris,* Lady's Bedstraw *Galium verum,* and Harebell *Campanula rotundifolia* were found. The wetter areas on the cliff face also contained Hemp-agrimony *Eupatorium cannabinum* but a strong sea influence was reflected by the presence of Buck's-horn Plantain *Plantago coronopus and* Sea Plantain *Plantago maritima.*

The intensive arable cultivation of the glacial soils on the chalk plateau has, over the last decade or more, been relaxed, with much land to the west of the Dyke now providing a rank, grassy rough to the new golf course. This was found to support a very restricted set of arable weeds although Hoary Ragwort *Senecio ericifolius* and Common Spotted Orchid *Dactylorhiza fuchsii* were of interest.

The picnic area to the north of the house site provided unexpected botanical bonus as an area of damp neutral grassland. The grassy bank on the east side contained Lesser Stitchwort *Stellaria graminea* and Marsh-bedstraw *Galium palustre* with Marsh Foxtail *Alopecurus geniculatus*, Bristle Club-rush *Isolepis setacea* and Oval Sedge *Carex leporina* in the adjoining grass, the latter two being new hectad records.

May Moss & Langdale Forest (VC62) 10 August 2013
(NGR Centrum SE856969 - Meeting Point only)

INTRODUCTION (Adrian Norris)
The meeting began quite unexpectedly and eventfully: firstly Mick Carroll, the leader of the group, was reported as being ill and unavailable; next, the officers at the gate stated that they did not know about the meeting and were reluctant to let us through, particularly because of an incident in the woodland. By the time the meeting should have been underway, the whole waiting area was full of cars awaiting access. Contact through the military police on site eventually allowed us access, but with a warning that a phosphorus bomb had been located and the bomb squad and a local fire engine were on site. A long trail of cars set off across the area, stopping for a short time close to the fence surrounding the facility. After a short talk about the site and what was happening, we were allowed to sign in: 29 people in 22 cars.. We moved *en masse* into the forest, stopping by the side of a track opposite May Moss. It was at this point that the fire engine, complete with the bomb squad appeared. The track was far too narrow for the vehicles to pass, which resulted in over 20 cars having to reverse back down the track and allow the vehicles to pull into a passing place, so that the entire convoy could then move through. This whole process took quite a time and restricted the time available to us in this part of the woodland. It turned out that the fire department and the bomb squad had dealt with three phosphorus bombs.

The hot and dry weather also resulted in some members leaving early as the water levels in the bog, one of the main reasons for visiting, proved far too low.

BIRDS (Ian Glaves)

Overall, bird activity was quiet, due to the post-breeding dispersal, and the relative lateness in the day with observations starting after 10-30a.m. Around the Fylingdales compound there were several Barn Swallows feeding, as well as House Martin, Goldfinch, Linnet, Meadow Pipit and Wood Pigeon. On the forest road between May Moss and Hipperley Beck, a juvenile Grey Wagtail was seen (and one was picked up dead), as well as Mistle Thrush, Green Woodpecker and a pair of Goshawk. Carrion Crow, Common Buzzard, Common Swift and Blackbird were also reported. A prolonged stay in the Hipperly Beck area produced parties of Chaffinch, Coal Tit and three Common Crossbills. Siskin was heard on several occasions, and seen once. Great Spotted Woodpecker was heard calling.

MOLLUSCS (Adrian Norris)

The Molluscan Section was represented by David Lindley, Terry Crawford, Alex Hart, a student from York University, and AN. A total of 64 records was made from eight 1km squares, mostly from the roadsides, the forest being too acid in most places to be very rich in molluscs. On the 9th of July Terry made an additional visit and recorded 33 specimens from a separate eight 1km squares. In total the combined list produced 41 species.

Most of the records are typical of the fairly acid habitats available, and the long period of hot and dry weather made it difficult to find certain species. The sites surrounding the Fylingdales military site produced a number of the common Wrinkled Snail *Candidula intersecta*, associated with limestone grassland and introduced with the limestone rubble which makes up the roads surrounding the site. A few of the more local molluscs were located, including; *Cochlicopa lubricella, Columella aspera, Euconulua alderi* and Dwarf Snail *Punctum pygmaeum*. A single *Vertigo* was located which unfortunately proved to be the Common Whorl Snail *V. pygmaea*.

INSECTS - Butterflies and Moths (Peter Tannett)

A largely cloudy day with a somewhat cool breeze on exposed higher ground limited the activity of butterflies. The Peacock was present commonly in almost all areas. Single examples of the Small Tortoiseshell, Red Admiral, Painted Lady, Brimstone, Small Copper and Common Blue were noted. Meadow Brown, Ringlet, Small and Large Whites, Green-veined White were widespread and the Small Skipper was also present. Day flying moths seen were Silver Y, Antler Moth and Narrow-bordered 5-spot Burnet. Amongst some smaller Geometers were Shaded-broad Bar, Twin-spot Carpet and the July Highflier. *Udea lutealis* was common.

INSECTS - Parasitic Hymenoptera (Bill Ely)

At May Moss I collected the pimpline ichneumon *Zatypota discolor*, which is an ectoparasitoid of spiders and is recorded from specimens of *Theridion*. When I was an

omnivorous collector in Rotherham I occasionally found immature spiders with small ichneumon larvae wrapped around their abdomens with their jaws buried in the host, but by then both host and parasitoid were dead. This ichneumon is recorded from heathland and is **new to Yorkshire**. The campoplegine *Cymodusa antennator* was also here and is the second Yorkshire record and the first for VC62. All of the Cremastinae are rare in Yorkshire and the specimens of *Cremastus geminus* that I found at May Moss are new to VC62. This is supposed to be coastal but the two previous Yorkshire records are much further inland than Fylingdales! The ichneumonine *Coelichneumon validus* from the roadside at May Moss is the 5th Yorkshire record, the first since 1950 and is also new to VC62.

Alexandra Hart (see the Conchology report) collected the cryptine ichneumon *Gambrus bipunctatus* at Allerston High Moor close by Blakey Topping. The history of this genus is confused, and not just in Yorkshire. Specimens that I collected in the 1980s were identified as *G. ornatus* using a translation of Kasparyan's Russian key. About 15 years ago it was decided that specimens named as *ornatus* were misidentifications of *G. bipunctatus* and that *ornatus* was a synonym of *G. incubitor,* so I transferred the Yorkshire records accordingly. A new key to British cryptines is currently in development by the Austrian entomologist Mark Schwartz using structural characters to supplement the colour ones which were the main features used by Kasparyan. From this it is clear that the earlier specimens are the re-instated *ornatus,* which means that Alexandra's specimen is **new to Yorkshire.**

Close by I found the anomaline ichneumon *Barylypa delictor*. The ichneumons in this subfamily have very elongate gasters (the apparent abdomens) instead of long ovipositors and the female inserts the whole gaster into the rolled leaves to reach the host caterpillars. There is one unconfirmed record from VC63 in the late C19th but this is the first confirmed Yorkshire record. The pimpline *Itoplectis aterrima* was also at Allerston High Moor and is the second VC62 record and new to the NYMNP. The proctotrupid *Parthenocodrus elongatus* was also found here and is the fourth Yorkshire record and the second from VC62 – Harry Britten jnr recorded it at the nearby Hole of Horcum in 1937.

The banchine *Glypta longicauda* was further east in Langdale Forest at Barley Carr Rigg and is new to VC62, though it is quite frequent in the south of the county. The second VC62 record of the campoplegine *Diadegma majale* was here and is new to the NYMNP. The fifth Yorkshire record of the tersilochine *Epistathmus crassicornis* was also here and is the third for this part of the NYMNP, having been found previously at Bridestones and Forge Valley. It had not been recorded in Yorkshire for 25 years..

INSECTS - Coleoptera (Bill Ely)

The net-winged beetle *Pyropterus nigroruber* was collected at the roadside at May Moss. Bob Marsh reports that this is the fifth record for VC62 and all records are within the NYMNP, from Duncombe Park in the west to Hayburn Wyke in the east.

INSECTS - Diptera (Andrew Grayson)

The weather remained fair, but a persistent and moderately strong cool breeze caused Diptera to be concentrated in sheltered areas. I investigated three such areas near the periphery of May Moss: a moorland edge bordering a coniferous plantation at Wood Slack (SE870967); a boggy area dominated by sedges and mosses near Worm Sike (SE871968); and a sloped area of moorland and grassland around boggy gullies near Eller Beck (SE869978). Hoverflies were quite scarce, apart from the large *Sericomyia silentis*, which was present in all three areas. The most noteworthy hoverfly was *Xylota jakutorum* at Wood Slack. The fauna of parasitic flies included the conspicuous large species *Tachina grossa* and *Linnaemya vulpina* near Worm Sike and Eller Beck. These are both local in Yorkshire and typically occur at boggy moorland-edge habitats. The long-legged fly *Dolichopus rupestris* is widespread but local in boggy areas and was locally common near Worm Sike. The most significant find of the day was a male of the crane-fly *Tipula pabulina* near Eller Beck, this being an addition to the VC62 list.

PLANT GALLS (John Newbould & Tom Higginbottom)

We initially approached recording at this meeting with some trepidation, on a site dominated by moorland and blocks of coniferous forest. However, once on the forest roads we discovered a range of deciduous trees with herb-rich vegetation in the open grassy glades. During the day, we sampled eight 1km squares, making 42 records on 14 host plants with 26 gall causers.

At the first stop, in SE8794, our attention was drawn to red colouration on what we thought were leaves of Bilberry *Vaccinium myrtilus*. After looking through the FSC *British Plant Galls* key we were excited to discover the galls were caused by a micro-fungus. However, this made identification of the causer difficult. Specimens were sent to Dr Brian Spooner who identified *Exobasidium vaccinii* on Crowberry *Vaccinium vitis-idaea*. This was our only record of this species during the day and there are only a few records of it from Scotland on the NBN Gateway. At the same site, a young Pedunculate Oak *Quercus robur* had examples of the Common Spangle Galls *Neuroterus quercusbaccarum* and Silk-button Spangle Gall *N. numismalis* and also the quite scarce Striped Pea Gall *Cynips longiventris*. *Cynips* species have been rather uncommon in recent years.

FLOWERING PLANTS (Richard Middleton)

The first site visited by the botanists was at the head of Hipperley Beck, near Brecken Howe, where a stand of spruce within the surrounding pine forest had been clear-felled and the natural regeneration of vegetation could be observed. Here the re-establishment of the original mire was being actively encouraged by obstructing the forestry drainage channels with timber dams. Although there were the expected colonisers, including Rosebay Willowherb *Chamerion angustifolium* and Prickly Sow-thistle *Sonchus asper*, the abundance of Heath Groundsel *Senecio sylvaticus* was less expected. It was encouraging to see a vigorous development of a wet heath community including Common Cottongrass *Eriophorum angustifolium*, Hare's-tail Cottongrass *E. vaginatum* and Star Sedge *Carex*

echinata along with Heather *Calluna vulgaris* and Purple Moor-grass *Molinia caerulea*. The damper areas supported Cuckooflower *Cardamine pratensis*, Lesser Spearwort *Ranunculus flammula* and Marsh Violet *Viola palustris*. In the very wettest parts along the beck there were colonies of Marsh Pennywort *Hydrocotyle vulgaris* (complete with its rarely noticed flowers), Bog Pondweed *Potamogeton polygonifolius* and Water Horsetail *Equisetum fluviatile*.

The second focus of attention was 3km further south, at the junction of forest tracks near Bickley School House. Here the substrate was much more lime-rich and the ditches supported Common Butterwort *Pinguicula vulgaris*, Bog Asphodel *Narthecium ossifragum*, both Common Yellow Sedge *Carex demissa* and Long-stalked Yellow Sedge *C. lepidocarpa*, along with a variety of rushes *Juncus* spp. Among the grasses on the drier verges were False Brome *Brachypodium sylvaticum*, good stands of Wood Small-reed *Calamagrostis epigejos* and occasional plants of Heath-grass *Danthonia decumbens*. Three species of St John's-wort were recorded - Square-stalked *Hypericum tetrapterum*, Perforate *H. perforatum* and Slender *H. pulchrum*, and three species of Hawkbit – Autumn *Scorzoneroides autumnalis*, Rough *Leontodon hispidus* and Lesser *L. saxatilis*.

Other notable plants seen on the forest verges during the course of the day were Wild Marjoram *Origanum vulgare*, including a white-flowered form, and Bifid Hemp-nettle *Galeopsis bifidus* which often passes undifferentiated from the Common Hemp-nettle *G. tetrahit*.

Note: The motif of an autumn leaf, used to separate the different reports, was drawn by the late Elizabeth Farningham.

YNU Notice: Recent deaths

Sadly, we have to report the deaths in recent months of four local naturalists. Helen Jackson was a former President of the Union who worked wholeheartedly on the selection of Nature Reserves for management by the Yorkshire Wildlife Trust. Les Magee, also a former President, was a naturalist of widest experience and a freshwater specialist par excellence. Douglas Richardson was an Other Arthropods specialist and a deeply committed microscopist. Derek Yalden, faunal specialist and author, had one of his latest papers, on the dispersal of crab apples by deer, published in this journal (*The Naturalist* **137**:165-168). An obituary of each of the above will appear in a future issue of this journal.

Calendar 2014

Items are shown up to August 2014, plus the AGM. Future issues will show the remaining events.

Feb	1	Natural Sciences Forum. St Chad's Parish Hall, Leeds, 10.00am to 12.30pm
Mar	9	Lepidoptera Group Annual Meeting . Bramham Village Hall at 11:00.
	15	Entomological Section: Recorders' Reports, Conversazione, Wilberfoss Community Centre at 2:00.
	22	**YNU Annual Conference, York** (see p219)
Apr	5	Conchological Section Field Meeting Junction Canal VC63. Meet in car park by canal bridge on Top Lane SE 621126 at 10:30.
May	3	Bryology Section Field Meeting. VC64, Ingleborough. Meet in the old quarry at Storrs Common on the B6255 near Ingleton SD702733 at 10:00. (Note : if the weather is fine be prepared for an ascent to high ground on Ingleborough.)
	6	Training Day - *Basic Field Skills* for Leeds Univ. students. Leeds Discovery Centre 9:30 Contact Roger Key if you are willing to tutor a small group.
	10	Conchological Section and Freshwater Ecology Section joint Field Meeting. Leeds and Liverpool canal, East Marton. Meet by village green SD908509 at 10:30.
	17	**VC62 Excursion** Forge Valley near Scarborough.
	17	Marine and Coastal Section Robin Hood's Bay NZ953048 – MBA Shore Thing Survey. Meet at 10:30.
	31	Botany Section Field Meeting VC61, Millington (Wolds). Meet on the roadside SE839530, 10:30.
	31	Freshwater Ecology Section Meet Ribblehead car park SD765792 at 10:30.
Jun	7	Botany Section Field Meeting VC64, Kippax. Meet in the car park SE405295 at 10:30.
	14	**VC63 Excursion** Thorpe Marsh YWT Reserve.
	14,15	Marine and Coastal Section Runswick Bay NZ817155. Meet at 10:00.
	19-24	Swaledale Survey. Contact: AdrianXNorris@aol.com or Johna72newbould@yahoo.co.uk
	29	Botany Section Field Meeting VC62, Kilburn. Meet in the small car park SE514805 at 10:30.
Jul	12	**VC64 Excursion** Austwick and Lawkland Moss SSSI.
	13	Marine and Coastal Section South Landing Flamborough TA230692 – MBA Shore Thing Survey. Meet at 10:00.
	19	**VC65 Excursion** Grinton based near the Scabba Wath Juniper scrub area.
	26	Botany Section Field Meeting VC63, Dunford Bridge. Meet in the TP Trail car park SE159023 at 10:30.
Aug	9	**VC61 Excursion** Skerne Wetlands .
Nov	15	**AGM,** Settle. Venue tbc.

Yorkshire Naturalists' Union

c/o NEYEDC, St William College, 5 College Street, York YO1 7JF
Tel: 01904 641631 Email: membership@ynu.org.uk
Website: www.ynu.org.uk
Registered Charity No. 224018

The Naturalist

This publication is issued free to individual members of the Yorkshire Naturalists' Union and to Affiliated Societies. The Editorial Board of *The Naturalist* is currently:

Notice to contributors

Contributors should indicate whether they wish their manuscripts to be subjected to anonymous peer review. All other manuscripts will be reviewed by the Editorial Board who at their discretion may send them to third parties for comment and advice.

Original articles should be submitted electronically as an MS Word document to Dr A. Millard at a.millard@leedsmet.ac.uk.

Please see *The Naturalist Guide to Consistency* on p77 of *The Naturalist* 1079 and please **avoid** the following:

- using tabs to tabulate information (please use MS Word table format or separate the column entries in a single row with commas and enter a paragraph mark at the end of the row).
- inserting any figures, graphs or plates into the text; indicate their proposed locations in the text and send as separate files.

Good quality, high resolution images are very welcome and should be sent as .jpg files, with a separate MS Word file containing the caption and name of the person to whom the image should be attributed.

If electronic submission is not possible, contributions should be sent to Dr. A. Millard, Woodland Villas, 86 Bachelor Lane, Horsforth, Leeds LS18 5NF (Tel. 0113 258 2482)

Contributors should ensure the accuracy of reference citations. The Editorial Board and Council accept no responsibility for opinions expressed by contributors.

Copy Dates:
April issue - **14 February**; August issue - **14 June**; December issue - **14 October**

ISSN 0028-0771

Yorkshire Naturalists' Union

MIX
Paper from responsible sources
FSC® C012290
FSC www.fsc.org

DUFFIELD digital
Printed by Duffield Digital
www.duffieldprinters.co.uk

The Naturalist

April 2014
Volume 139
Number 1085

Yorkshire Naturalists' Union

Journal of Natural History for the North of England

The Naturalist

Vol. 139 No. 1085 April 2014

Contents

An asterisk* indicates a peer-reviewed paper

Front cover: Purple Milk-vetch *Astragalus danicus* (see p33 and Plate II, centre pages). Photo: *J.Simmons*

Back cover: Fungus-induced gall *Gymnosporangium cornutum* on Rowan. This is a northern species which has Juniper as its alternative host (see p58). Photo: *J.Newbould*

Yorkshire Naturalists' Union

The Naturalist

April 2014 Volume 139 Number 1085

Editorial

This issue carries several articles about the natural history of the northwestern part of Yorkshire with an emphasis on Swaledale. The main reason for the visits organised by our immediate past President and carried out in 2009 and 2013 were that the valley's wildlife has not been well recorded in the past and the reports here help to address that. Further visits are planned for the coming year and **you** are invited to join us for one or more days but it really helps to know if you will attend as we try to fill cars to save on petrol. There is no mobile phone in the Upper Dale but it is available at Marske and in the Richmond area, so you are asked to contact Johna72newbould@yahoo.co.uk before the week begins and he will email full programme details with locations of possible accommodation. Grid references for the meeting places are on the 2014 membership card.

The programme of events is as follows:

Thursday 19 June	Marske, where Cat Bank Road meets Marske Beck north of Marske Hall.
Friday 20 June	Hag Wood and Hudswell Wood National Trust properties, Richmond.
Saturday 21 June	Arkengarthdale for Calaminarian grassland with Moonwort then across moorland to Healaugh.
Sunday 22 June	Gunnerside on the bridleway to Ivelet to look for Small White Orchid on wet pastures.
Monday 23 June	Muker for floristically diverse hay meadows.
Tuesday 24 June	location to be arranged.
Wednesday 25 June	Brompton-on-Swale by Brompton Bridge for the lower Swale Valley east of the A1.

Natural England's Yorkshire Dales Team warns us that the disease *Phytophthora austrocedrae*, which is fatal to Juniper, has been found at several sites in Swaledale and the team now has a duty to discourage access to Juniper in the dale. Plant material should not be taken from infected sites in case of the small risks of spreading the disease. For anybody

with an interest in horticulture they also recommend disinfecting any footware or gloves before approaching ornamental conifers in the garden as *Phytophthora* has been found in species of cedar and cypress as well.

Terry Whitaker, our President this year, writes "please respect this request from Natural England with regard to Juniper. We have learned that not only are sites in the Dales affected but also in County Durham and Cumbria, including a number of National Trust sites in the Lake District."

What can natural history societies achieve?

The Presidential Address delivered following the Annual General Meeting at the Palm Court Hotel, Scarborough on 16th November 2013

John A. Newbould
Stonecroft, 3 Brookmead Close, Sutton Poyntz, Weymouth DT3 6RS
e-mail: Johna72newbould@yahoo.co.uk

> *"Imagination is more important than knowledge. For knowledge is limited to all we know and understand, while imagination embraces the entire world and all there ever will be to know and understand."*
>
> *Albert Einstein*

Introduction

There have been a considerable number of developments in the way that we record nature, the place of nature in town and country, and the statutory protection of some species and habitats since the YNU was founded in 1861. At the National Biodiversity Network (NBN) Trust conference held at the Royal Society on 15 November 2013, we learned that the European Habitats Directive protects 89 species and 77 habitats for which Britain has international responsibility. Do we know what we need to know to support these designations? What is the evidence? Is it accessible? Is it open and transparent? (E. Mackey, Scottish Natural Heritage presentation). This paper looks at the contribution to our knowledge base made by Yorkshire's naturalists, some born and bred in the county, others with tenures at our major educational institutions.

Despite a poorly performing economy in 2013, there may be some room for optimism regarding wildlife recording. During 2013 the Whitby Naturalists' Club and the British Ecological Society (BES) celebrated their centenaries; the Institute of Ecologists and Environmental Managers received a Royal Charter giving formal recognition of the role of ecologists in our society and the Field Studies Council (FSC) celebrated its 70th anniversary with a major project known as Biodiversity Fellows, providing training in the less well-

known and underworked biological groups. The National Federation for Biological Recording (NFBR) has changed its name to the National Forum for Biological Recording and has become a registered charity. The YNU has, I believe, had a representative on the NFBR Council since its inception in 1986. In 2012 we celebrated the 50 years since the world's first plant atlas was produced (Preston, 2013) and in 2014 the Biological Records Centre founded at Monks Wood will celebrate its half-centenary.

This optimism is tempered, however, by significant cuts in the budget of the Department of Environment, Food and Rural Affairs (DEFRA), resulting in reduced funding for biological recording. It is critical for the maintenance of funding that amateur naturalists transfer data electronically to a local record centre, a national recording scheme or otherwise onto the NBN Gateway, especially for less well-worked groups. Data that are unused are lost. JNCC's finances have been described as between a rock and a hard place, which will result in some monitoring programmes facing funding cuts though the new priorities of pollination and alien species may benefit from increased funding.

Influences on my own practice

My own overall aims are to help people to appreciate nature and to use modern electronic techniques to record a species accurately - its identity and the location and date of the observation - and to clarify the contributions made by Yorkshire botanists in the development of species atlases and habitat classification. A typical instance occurred when I visited Edinburgh in September 2012 for the Botanical Society of the British Isles (BSBI) conference celebrating the fiftieth anniversary of the publication of the first-ever national atlas of species distribution (Braithwaite and Walker, 2013). I stayed with a university friend and we walked to Cramond Island on the southeast shore of the Firth of Forth. Here he spotted a butterfly on Ragwort *Senecio jacobea* and asked what type it was. I told him it was a Peacock *Inachis io* and showed him the inexpensive FSC chart which would have allowed him to make his own identification. Despite living in the country near the Muirshields Country Park for 25 years, he admitted the only butterfly he knew was a Red Admiral *Vanessa atalanta*. I later showed him how the distribution of plants and animals in the country could be seen on the NBN Gateway. It is vitally important that we be ambassadors for wildlife and biodiversity as, while most people are only vaguely interested, others would really like to learn.

My own interest in recording began aged 10-11 at primary school when the late John Vaughan enthused his class to bring wildflowers to school, preferably identified, and awarded a gold star for the first record, silver for the second, *etc.* My interest waned in my teenage years but I started to holiday on the Norfolk Broads in my early twenties. Exploration of this region, coupled with my subsequent marriage to Liz, whose brother Richard Comley was interested in wild flowers, renewed in me what was to become a lifetime passion for natural history. Regular trips to Norfolk coupled with local interpretation inspired me to read Ted Ellis' New Naturalist volume *The Broads* (1965) containing Dr Joyce Lambert's account of the formation of the Broads. She described the process of transition

from open water to fen, then willow carr and subsequently oak woodland. This book, coupled with the subsequent publication *The Land Use, Ecology and Conservation of Broadland* by Dr Martin George (1992), who headed the Norwich office of the Nature Conservancy Council (NCC) in the 1970-80s, extended my thinking from not just what is seen but why. The understanding so gained assisted me later when formulating management plans for Denaby Ings Nature Reserve and Laughton Pool within the Roche Abbey woodlands SSSI, where infilling of the water bodies is a problem.

Subsequently, recording and mapping the different vegetation communities at the Maltby Low Common Nature Reserve and publications such as *Plantatt* by Hill *et al.* (2004) and occasional exposure to the work of Sheffield University's NERC Grassland Ecology Unit (Grime *et. al.,* 2007) intensified my interest.

A Note on Landscape History

Before discussing vegetation analysis more fully, I would like to say something of another relevant interest of mine which came to the fore shortly after I moved to Dorset. In 1999 I was invited to join the Dorset County Boundary Study, where much time is devoted to establishing whether coppice stools present today are at the locations mentioned in Saxon charters. I also took up a suggestion from Martin Papworth (South-west Region Archaeologist for the National Trust) to survey the historic hedgerows of the National Trust's Golden Cap Estate (Newbould, 2005). This study introduced me to the history of landscape and the countryside (Rackham, 2003), important areas for local study and evaluation; I have visited places in Yorkshire such as Ruswarp, Wykham, Back Lane at Hooton Roberts, Fishlake and Appletreewick (where old Ash *Fraxinus axcelsior* marked an historic routeway), which would provide material for similar study.

I was asked to provide a list of notable trees for the Golden Cap Estate during 2013. I provided a list of some 80 large coppice stools and significant pollard and maiden trees from the hedgerow surveys undertaken earlier using the standard DEFRA model (Hill *et al.,* 2005) of 30m samples. However, many more could be seen from the office window! I arranged with staff to survey the 1km square adjacent to the office on a field boundary basis and added another 120 significant coppice stools, mainly of Maple *Acer campestre*, Holly *Ilex aquifolia* and Ash, together with maiden and pollard oak and Ash. Significantly, many of these trees were located on parish boundaries and on the old Roman road fro m Dorchester to Exeter (see Plate I, centre pages). (Preliminary maps of this ancient landscape were exhibited at the AGM.)

It is to the County Archives that a natural historian should turn to discover the early vegetation maps of a parish. Occasionally an estate map will be found showing meadows, woodland, ponds, orchards, etc. Better are the series of parish Tithe Maps from 1830-40, showing arable, meadow, pasture, willow, furze, orchards and ponds. With both orchards and ponds being Biodiversity Priority Habitats, a local society is in a position to research such features as are present today and, with the owner's permission, conduct a survey.

Also in an historical context, L. Dudley Stamp organised a land use survey of England using the 6-inch Ordnance Survey series maps, mainly dated 1929 but some from the 1902 series. The work done by primary schools is historically important and most of the maps were archived by Imperial College. Dr Ruth Swetman reported to the NFBR 2006 Conference that she had used both the Tithe Maps and the Dudley Stamp series, together with modern NVC phase 1 maps, to measure land use change over 160 years. She went to talk to the Women's Institute in the parish of Wisbech St Mary about these changes and discussion with members of various ages there helped to pinpoint the timing of the changes, which were mostly post-Second World War. Is this an exercise that local societies could usefully undertake?

Habitat/vegetation surveying and the YNU contribution

During the period 1991-2000 NCC and Cambridge University Press published five volumes on *British Plant Communities*, edited by John Rodwell with contributions from a small group of YNU members such as Geoffrey Wilmore, Jeff Lunn and Ian Rotherham. Such a mammoth task was not started from scratch but built upon the conceptions of many naturalists, some with Yorkshire associations. Crucially, the vegetation communities were compiled by statistical analysis of standard quadrat data. The work was never completed.

Yorkshire has a long association with the scientific study of vegetation communities. F. Arnold Lees (1888) provided a list of plants and their locations in the traditional taxonomic order together with a major chapter on climatology and listed the altitudinal limits of individual plants. T.W. Woodhead of Huddersfield and W.H. Pearsall of Leeds University were editors of *The Naturalist* and YNU Presidents who also studied vegetation ecology. Woodhead delivered his Presidential address in Scarborough on 9 December 1922 whilst Pearsall spoke at Wakefield on 4 December 1937. Woodhead (1923) opened by commenting that "throughout its long history, it has been one of the chief aims of the Union to encourage the amateur in science..." and went on to say that Union members are drawn from every class and calling, including "Bankers, Butchers, Doctors, Dentists, Drapers, Civil Servants and Chemists, Professors and Museum Curators". Sadly, managements across the country are culling natural sciences curators. As with Woodhead, it is perhaps a sign of old age and, in my case, of long experience in managing the Union's membership that I should reminisce, take stock of past achievements and consider the future, lest the Union and *inter alia* natural history recording drift into an "unstable and adverse condition".

Reading through Presidential addresses from around ninety years ago has highlighted for me how the scientists of yesteryear were tackling problems that we today face with technology at our disposal that they could not imagine. Woodhead pays tribute to the contribution of the amateur naturalist, referring to the *Flora of the West Riding* by Miall & Carrington (1862) and to Miall's comment that "those who make foolish objections to systems of names as dry and unprofitable, may be reminded that the most valuable discoveries in science and generally in philosophy have been merely fresh combinations of facts known before". Is this relevant to arguments today about publishing lists in *The*

Naturalist?. Certainly, electronic lists in Microsoft Excel or other public databases make for easier data searching and analysis (Higginbottom & Newbould, 2014).

On 3 December 1904 a meeting was held at the house of Dr W.G. Smith in Leeds to discuss the position of vegetation surveying in Britain, which had been trialled in Perthshire by Robert Smith and in Yorkshire by W.G. Smith and his students starting in the 1890s (Sheal, 1988). Also present were C.E. Moss, A.G. Tansley and T.W. Woodhead. It was resolved to form a committee to advance the interests of botanical survey, to be called "The Central Committee for the Survey and Study of British Vegetation". After some nine years with membership confined to just twelve people and a wide circle of botanists demanding membership, the BES was founded in April 1913 at a meeting held at University College, London. In anticipation, the first part of the *Journal of Ecology* was issued on 1 March 1913. Tansley specified two aims for the *Journal:*

- "to foster and promote in all ways the study of ecology in these islands
- to endeavour to present a record on the progress of ecology through the world" (Hutchins *et.al.,* 2012).

Whitby Naturalists' Club is in very august company, being founded in the same month and year as the BES, now with a worldwide membership and which returned to its Yorkshire roots to hold its centenary symposium at the University of Sheffield in September 2011.

On a smaller canvas, our own natural history societies have been undertaking such studies and publishing them in *The Naturalist* for an even longer period. Much of the work on surveying British vegetation before 1913 was published in *New Phytologist* and *The Naturalist,* together with *Types of British Vegetation* (published by Cambridge University Press in 1911) which Tansley described as a preliminary work. Much of W.H. Pearsall's work published in *The Naturalist* related to the vegetation of acid soils highly relevant to the large area of moorland and lowland heath in Yorkshire. In his Presidential address (Pearsall, 1938) he provided evidence of the "conditions of the soil or *edaphic* factors as the prime factors controlling the distribution of vegetation".

A sign of the significant progress made in vegetation classification is that Woodhead's (1924) *Introduction to Botany and Plant Ecology* (written for secondary school examinations) classified vegetation in what we today call the UK Broad Habitat types. Even during the Second World War the YNU had a Committee of Research under Professor Priestley with Chris Cheetham, its Secretary, reporting on the Ecology of a Heather Moor. (Cheetham, 1942). Albert Henderson commented recently that I am one of very few members who write on vegetation communities in YNU journals today and I urge our younger members to consider vegetation communities when writing reports.

Professor D.H. Valentine, in his Presidential Address delivered at Ilkley in 1960 (Valentine, 1961) also praised the influence of L.C. Miall from his schoolboy readings. In a wide-ranging address on the future of the British flora, Valentine reported how accurate assessment of the ecological preferences of plants enabled M.J. Harvey and himself to search for and find

new localities for the Teesdale Violet *Viola rupestris* on Arnside in Westmorland. It was previously only known from a southwest-facing limestone grassland slope on Widdybank Fell.

Mapping and survey systems

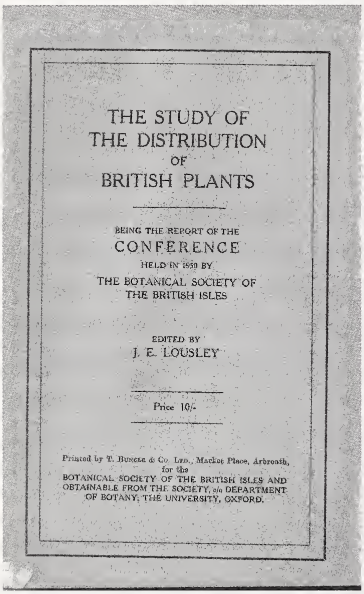
A mapping system was devised for the rapid mapping of wildlife habitats over large areas of the countryside in the late 1970s. The system was modified and extended following the passing of the Wildlife and Countryside Act (1981) for use on SSSIs (Anon, 1990). NCC made the early completion of nationwide surveys of biological features a priority objective (Anon, 1984) with the aim of identifying all the areas which qualify for wildlife protection and management. Surveyors in the East Riding were still working on this in 2011! Nowadays professionals use products such as *Mapinfo* to digitise such tasks. Scientists in local environmental records centres best do such mapping, especially of SSSIs and local sites of nature conservation importance (SINCs). There is a cost for providing such a service and, while most local authorities in Dorset appreciate the need for this service and contribute to the costs, few in North Yorkshire appreciate the need and others are not prepared to fund the relatively small sums required to provide the service, which could be a costly mistake in the event of litigation over an unsound planning decision.

Mapping species using the Ordnance Survey (OS) Grid.

I will now move back to 1950 when another future YNU President spoke at a conference organised by the BSBI (Walters, 1951). This important conference spent two days considering how to record plants and what should be recorded. Max Walters described in a general way *"the study of the distribution of higher plants, with particular reference to the British Flora"*. Walters paid tribute to the work of H.C. Watson in providing a durable mapping system for Britain some 100 years previously. It was based, with a small number of exceptions, on the 1852 political county boundaries in order to establish constant boundaries enabling comparative studies of the British flora and fauna (see Plate II, centre pages). Watson was born at Firbeck, Rotherham, on 9 May 1804 and was fittingly remembered in September 2013 when the Friends of Firbeck Hall unveiled a commemorative plaque to him as the "botanist who standardised the study and recording of plant distribution in Great Britain". Not only was the system of Watsonian vice-counties of service in the production of distribution maps until the 1950s but it has also served as a sound basis for the YNU to organise annual Excursions in each vice county on a rotational basis. It provides for YNU members an excellent basis for studying and comparing the flora and fauna across England's largest county. Nationally also it has been the basis of publication of many floras, other atlases and accounts of county fauna (Preston, 2013). In Yorkshire we can be proud that the last twenty-odd years have seen the publication of the *Flora of the East Riding* (Crackles, 1990), the *Plant Atlas of West Yorkshire* (Lavin & Wilmore, 1994), the *Plant Atlas of Mid-west Yorkshire* (Abbott, 2005) and the *Plant Atlas of South Yorkshire* (Wilmore, Lunn & Rodwell, 2011).

Walters also stated that it was considered amongst plant geographers at the time that climate was the primary factor controlling the distribution of plants (and therefore of many other species e.g., invertebrates). He also highlighted soil factors but in a subsidiary manner. This is not current thinking. Recent publications consider the chemical and physical characteristics of soil to be more important for optimum growth of both lower and higher plants (Grime *et al.,* 2007; Hill *et al.,* 2004, 2007; Rodwell, 1991-2000). There is much worldwide current research in the role of soil fungi and plant development. Natural England highlights the fragility of soil in many farmland ecosystems. Walters correctly pointed out that the great climatic and physiographic changes of the past have “left their mark on the present day distribution of organisms”. He also pointed out that the range of a species is subject to continuous variation. Members will recollect Professor Fitter’s demonstration of this in his 2011 conference address in relation to the Comma Butterfly *Polygonia c-album*.

Another famous Yorkshire botanist, Professor A.R. Clapham of the University of Sheffield, in the last talk at the same BSBI conference (see Fig. 1), proposed that an atlas be produced on the basis of reporting distribution by 10km square, given the adoption by OS of the metric 100km square mapping system (Clapham, 1951). He said that 10km squares “have great advantage as being considerably smaller than vice-counties and [they] can give much more precise information about distribution within the general range”. Walters and Clapham were not alone in their thinking. Professor Ronald Good of the University of Hull had attempted to dot-map various Dorset plants prior to the Second World War. After some debate BSBI agreed to the proposal to produce the atlas, obtained the necessary finance and appointed S.M. Walters as project director with Dr Franklyn Perring in day-to-day control. Within some eight years the mainly amateur botanical community had obtained sufficient data to produce the world's first such atlas (Perring and Walters, 1962). There were, however, some gaps with SK49 (Rotherham, South Yorkshire) having just 206 species. Following the opening of a Biological Records Centre at Rotherham Museum in 1975 under Bill Ely, and with the help of Rotherham Naturalists’ Society and other local societies, the situation was rectified with over 1000 species historically listed on the NBN Gateway today.


THE STUDY OF
THE DISTRIBUTION
OF
BRITISH PLANTS

BEING THE REPORT OF THE
CONFERENCE
HELD IN 1950 BY
THE BOTANICAL SOCIETY OF
THE BRITISH ISLES

EDITED BY
J. E. LOUSLEY

Price 10/-

Printed by T. Buncle & Co. Ltd., Market Place, Arbroath,
for the
BOTANICAL SOCIETY OF THE BRITISH ISLES AND
OBTAINABLE FROM THE SOCIETY, c/o DEPARTMENT
OF BOTANY, THE UNIVERSITY, OXFORD.

Figure 1. The front cover of the 1950 BSBI Conference Report containing the proposal that a national plant atlas should be produced.

The 10km square is the basis of most national recording scheme atlas projects today in the UK, allowing good statistical analysis of trends. The publication of the *BTO Bird Atlas* (Balmer *et al.,* 2013) is a testimony to hard work by many amateur naturalists across the UK, supported by a small team of professionals within BTO. It is well known that publication of such atlases produces a flurry of activity when gaps are perceived. Steve Cham highlighted

this problem at the 2013 NBN conference for both county and national levels during the production of the British Dragonfly Society's national atlas. He commented that without professional help from Steve Prentice, coupled with the payment of travel expenses, many of the remote areas of Britain would not have been recorded. At one point scientists considered that it was pointless to repeat the exercise once an atlas had been produced. It took many years for BTO to follow the botanists' example, when its first atlas in 1976 was followed by a second in 1988-91. To the surprise of many, data analysis showed many changes, including a considerable change in farmland bird populations (Gibbons *et al.*, 1993). Such volunteer recording provided the evidence required to justify stewardship payments on farmland. Full credit must be given to all Yorkshire bird watchers who contributed to the third BTO Atlas, especially those Union members who acted as regional organisers and validators including Mike Denton, Geoff Dobbs, Mick Carroll, Phil Bone and Gerald Light.

Unexpectedly, atlas methodology influenced conservation (Preston, 2013). Similar results were obtained following repeat surveys of both plants and butterflies in the late 1990s (Preston *et al.*, 2012). The importance of national mapping schemes in identifying declining species and, thereby, influencing conservationists in the selection of SSSI criteria and biodiversity priorities is highlighted by Porter and Leach (2013). They state that the contribution of volunteer botanists in recording species is crucial for the under-resourced professionals responsible for spending public money on nature conservation schemes.

The National Biodiversity Network

The National Federation for Biological Recording was established in 1986. Its members included many of the leading thinkers in the practice of biological recording, including Sir John Burnett, Charlie Copp and Paul Harding, then head of the Biological Records Centre at Monks Wood. It became apparent in early discussions that a national strategy for the future of biological recording was essential. The Co-ordinating Commission for Biological Recording was established, chaired by Sir John and including YNU members Professor Mark Seaward (representing the Linnean Society) and Bill Ely (Rotherham Biological Records Centre) together with Charlie Copp and Paul Harding, funded in large part by the Department of the Environment. The opening paragraph of the CCBR's Executive Summary is worth quoting: *"Since the end of the nineteenth century, when national legislation was introduced to protect birds and seals and local authorities used by-laws under the Local Government Act 1888 to protect plants, concern for the environment has grown with increasing rapidity. Over the last 40 years, since the establishment of the Nature Conservancy in 1949, it has become accepted that informed policy and decisions on issues such as land use, planning, conservation and scientific enquiries, such as the detection of global warming, require a sound factual basis. An essential, crucially important element therefore is the public availability of accurate and extensive biological records"* (Burnett *et al.*, 1995). The report opened the pathway to the formation of the NBN Trust, which now provides a major element of such a service. The Trust has established data standards, quality controls and protocols for the production of databases. We must fight to protect and improve the

existing level of service, but the public purse cannot afford small private empires where data does not move to the Gateway.

The NBN Gateway receives data not only from local record centres but also from individuals, national societies and recording schemes to which many YNU recorders contribute. The YNU has been instrumental in the establishment of a number of national societies with a summary provided in Seaward (1982). The YNU also has its share of national recorders with six of our members managing a group within the 74 invertebrate national recording schemes (http://www.brc.ac.uk/recording_schemes.asp).

Whilst groups such as plants, birds, butterflies, moths and, to a lesser extent, dragonflies are well recorded in many areas with reasonably sized resident populations, it is the less popular groups such as flies, mosses and liverworts, lichens and aquatic and marine life where recorders are few and scattered across a wide area. A national hoverfly scheme recorder made an appeal at the NFBR 2013 Conference for senior recorders to take part in mentoring, training and encouraging younger naturalists to participate in such recording schemes (Morris 2012). I urge the YNU in partnership with local societies to engage in such mentoring schemes. Morris also reported that just 21 recorders have supplied 50% of the data held by the Hoverfly Recording Scheme and a new contributor of 500-1000 records is a major gain, equating to 2-4% of new data. Isaacs (2012) demonstrated a similar pattern with Orthoptera at the previous NBN Conference with just four recorders contributing 14% of the records. However, records archived with a local records centre need to be forwarded via the NBN Gateway to be incorporated into national recording schemes. There is evidence that this does not happen.

Biological recorders have engaged in producing many local and national recording schemes over the past sixty or so years , some resulting in the publication of an atlas or similar book. These projects have been based on various resolutions, from 10km squares through tetrads to 1km squares, but site-based data has only been acquired for sites of nature conservation importance (SINCs and SSSIs). The YNU has, however, a long history of providing reports on the important aspects of the sites it visits.

The future

Voluntary organisations stimulated popular and Government support for the Tansley report, cumulating in the National Park and Access to the Countryside Act (1949) together with the formation of the Nature Conservancy in 1948 with Cyril Diver as first Director General (Anon, 1971). It was not until 2009 that Hillary Benn, Leeds MP and Secretary of State for Environment, Food and Agriculture, requested that Sir John Lawton of York University review what was required to take nature conservation forward. Sir John was assisted by the great and good from the BES, including YNU member Professor Alistair Fitter. The group asked the question “Do England’s wildlife sites comprise a coherent and resilient ecological network? If not what needs to be done?” Lawton’s (2010) report highlights how the country’s landscape and wildlife have inspired and delighted generations and that we have a

duty to pass on such features to future generations. After all, the natural environment provides a wide range of benefits (ecosystem services) including food, water, minerals, medicines, flood defences and carbon sequestration together with economic and leisure benefits. In terms of wildlife the group found that specialists (e.g. Lapwing *Vanellus vanellus* and many pollinators) are in decline whilst generalists – species which adapt better - are doing fine. In an early (2005) example of the use of landscape-scale surveying for birds, the Swale and Ure Washlands Project surveyed the catchments of these rivers from Richmond to Boroughbridge in order to identify residual wetland sites from an area historically known to be marshy. By 2005 there was only 1 hectare of marshy land left in 95,000ha of agricultural land (Warwick, 2008). We cannot be complacent. Atlas recording schemes do not provide all the answers and <u>your</u> contribution, based on surveying sites good and bad, with data mobilised electronically preferably using iRecord (www.brc.ac.uk/irecord), is valuable. The system is not perfect and county verifiers need to know a little more about the ability of the users but one can attach a photograph, which may help.

Whilst preparing this Presidential address I have also been preparing a report for the National Trust on our 2013 visit to Hudswell Wood, Richmond. The last conservation assessment, undertaken by the National Trust in 1999, draws extensively on YNU members' survey reports including: Sarah White, A.W. Legg, Roy Crossley, Tom Blockeel and T. Woods. It is through such a series of written nature conservation evaluations undertaken at intervals that we can establish change with gains and losses. Our 2013 report clearly shows the decline in meadow floral diversity from the series of earlier reports. There is still much work to be undertaken, not only here but elsewhere in the County and I urge members to make their data available, as this is the only way progress or loss can be identified. The reputation of our society is dependent on the contribution made by members actively pursuing and reporting on their natural history investigations and collaborating with other conservation charities.

What, then, of the future? Following on from the Lawton review, a group from Newcastle University has identified that collaborative agri-environment schemes have more value for biodiversity than single farm schemes, with many key farmland animals ranging over an area larger than traditional British farms (McKenzie *et al.,* 2013). Natural England (2013) has published a series of on-line Powerpoint presentations outlining the importance of mosaics of habitats within the wider landscape to enhance habitat management for rare species. The BES established a citizen science group in early November 2013. This builds on successful projects run by OPAL, iSpot and special schemes running in partnership with both statutory and voluntary agencies. Once again, Yorkshire has been in the vanguard with Sarah West spearheading a very successful programme based at York University. Another important scheme, which I am certain would have been endorsed by the late Les Magee (secretary of the Freshwater Ecology Section), encourages anglers amongst others to report river flies seen whilst fishing. This partnership of over 100 organisations has been very successful in detecting pollution incidents at the earliest opportunity, allowing the Environment Agency to implement remedial measures swiftly. Les was an outstanding field

naturalist and angler with an unrivalled knowledge of the River Wharfe, accumulated over many years.

On a personal note, I believe the co-incidence mapping of interdependent plants and animals will become highly important whilst detailed mapping of rare plants visible at different times of the year will quickly highlight interdependent habitats. Maps of the day-flying Chimney-sweeper moth *Odezia atrata* and its larval foodplant Pignut *Conopodium majus* at 10km square level and also in VC65 at 1km square level demonstrate a disjointed recording effort between lepidopterists and botanists (see Plate III, centre pages, for both figures). A map (Plate IV, centre pages) of Petty Whin *Genista anglica* and Marsh Gentian *Gentiana pneumonanthe* at Winfrith Heath in Dorset shows detail of their relationship at a local scale and Colin Howes (pers. comm.) reports that a similar situation existed in earlier times at Doncaster Racecourse. Such multi-species mapping is becoming increasingly important to national agencies.

The immediate ecological task facing JNCC in 2014 includes monitoring the spread of aliens such as Harlequin Ladybird *Harmonia axyridis* and Water Fern *Azolla filiculoides* and establishing the state of pollinators. The importance of pollination in maintaining our lifestyle was highlighted by Goulson (2013). These are important tasks which local societies and their members can take part in and report on, truly contributing to our scientific knowledge base.

Acknowledgements
I am indebted to John Bowers for helping me to marshal my initial rambling thoughts; to Trevor James (NFBR) who kindly read an earlier draft and highlighted some small errors; to Paul Harding for opening my Presidential year by nominating me for honorary membership of the NBN Trust and to Albert Henderson for much help, kindness and friendship over many years as a YNU trustee. I would also like to thank Dr Helen Roy (CEH Wallingford) for assistance with the Chimney-sweeper-Pignut maps and Dorset Environmental Records Centre for use of the map of Winfrith Heath.

References

Abbott, P.P. (2005) *Plant Atlas of Mid-west Yorkshire.* Yorkshire Naturalists' Union, Leeds

Anon (1971) *Captain Cyril Diver – a memoir.* The Nature Conservancy, Furzebrook Research Station, Wareham.

Anon. (1984) *Nature conservation in Great Britain.* Nature Conservancy Council, Peterborough.

Anon (1990) *Handbook for Phase 1 habitat survey.* Nature Conservancy Council, Peterborough

Balmer, D., Gillings, S., Caffrey, B., Swann, B., Downie, I. & Fuller, R. (2013) *Bird Atlas 2007-11: The Breeding and Wintering Birds of Britain and Ireland.* British Trust for Ornithology, Thetford

Braithwaite, M.E. & Walker, K.J (2013) *Fifty years of mapping the British and Irish flora.* Botanical Society of the British Isles, London.

Burnett, J., Copp, C. & Harding, P. (1995) *Biological Recording in the United Kingdom – present practice and future development.* Department of the Environment, London.

Cheetam, C.A. (1942) the Ecology of a Heather Moor. *The Naturalist* 67: 164.

Clapham, A.R. (1951) A proposal for mapping British Vascular Plants. in Lousley, J.E.,Ed. *The study of*

the distribution of British Plants. Botanical Society of the British Isles, Oxford.

Crackles, F.E. (1990) *Flora of the East Riding Of Yorkshire.* Hull University Press, Hull

Ellis, E.A. (1965), *The Broads.* Collins New Naturalist 46, London.

Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993), *The New Atlas of Breeding Birds in Britain and Ireland, 1888-91,* Poyser. London.

George, M. (1992) *The Land Use, Ecology and Conservation of Broadland.* Packard Publishing Chichester.

Goulson, D. (2013) We have no Plan Bee for when we run out of pollinators. *Financial Times,* 9.11.2013.

Grime, J.P., Hodgson, J.P. & Hunt, R. (2007) *Comparative Plant Ecology.* Second edition, Castlepoint Press, Dalbeatie

Hill, D, Fasham, M, Tucker, G. Shewry, M & Shaw P. (2005) *Handbook of Biodiversity Methods – survey, evaluation and monitoring.* Cambridge University Press, Cambridge.

Hill, M.O., Preston, C.D. & Roy, D.B. (2004) *Plantatt. Atributes of British and Irish Plants: Status, Size, Life History, Geography and* Habitats. NERC Centre for Ecology and Hydrology Biological Records Centre, Monks Wood.

Hill, M.O., Preston, C.D., Bosanquet, S.D.S. & Roy, D.B. (2007) *Bryoatt – Attributes of British and Irish Mosses, Liverworts and Hornworts.* NERC Centre for Ecology and Hydrology, Wallingford.

Hutchins, M.J., Gibson, D.J., Bardgett, R.D., Rees, M., Newton, E., Baier, A. & Sandhu, L. (2012) Tansley's vision for the *Journal of Ecology* and a centenary celebration, *Journal of Ecology* 100, 1-5.

Lavin, J.C. & Wilmore, G.T.D. (1994) *The West Yorkshire Plant Atlas.* City of Bradford MDC.

Lees, F.A. (1888) The Flora of West Yorkshire. *Botanical Transactions of the Yorkshire Naturalists' Union Vol.* 2. Lovell, Reeve and Co., London.

McKenzie, A.J., Emery, S., Franks, J.R. & Whittingham, M.J. (2013) Landscape-scale conservation: collaborative agri-environment schemes could benefit both biodiversity and ecosystem services, but will farmers be willing to participate? *Journal of Applied Ecology* 50, 1274-1280.

Miall, L.C. & Carrington, B. (1862) *Flora of the West Riding.* Bradford.

Morris, R. (2012) Promoting biological recording – a developing conundrum. *British Wildlife* 24, 107-111.

Newbould, J.A. (2005) Southwest Dorset Hedges (2) – a survey of the National Trust's Golden Cap Estate in Barker, K. Ed. *Dorset Proceedings* 127, 111-123. Dorset Natural History and Archaeological Society, Dorchester

Newbould, J.A. & Higginbottom, T. (2014) Plant Galls in Swaledale. *The Naturalist* 139, 57-59

Pearsall, W.H. (1938) Soil types and Plant Ecology in Yorkshire. *The Naturalist* 53, 57-64.

Perring, F.H & Walter, S.M (1962) *Atlas of the British Flora*. Botanical Society of the British Isles and Thomas Nelson, London.

Porter, K. & Leach, S.J. (2013) Botanical records and their role in shaping nature conservation priorities and actions – an English perspective. *New Journal of Botany* 3 (3) 148-155.

Preston, C.D. (2013) Following B.S.B.I.s lead: the influence of the *Atlas of the British Flora. New Journal of Botany.*

Preston, C.D., Roy, D.B. and Roy, H.E. (2012) What have we learnt from 50 years of biological recording? *British Wildlife.* 24(2) 97-106.

Rackham, O. (2003) *Ancient Woodland – its history, vegetation and uses in England.* Castlepoint Press, Dalbeattie.

Rodwell, J.S. (ed.) (1991-2000) *British Plant Communities* 1-5 Cambridge University Press for the JNCC.

Rodwell, J.S., Dring, J.C., Averis, A.B.G., Proctor, M.C.F., Malloch, A.J.C., Schaminée, J.N.J., & Dargie, T.C.D. (2000) Review of the coverage of the National Vegetation Classification, *J.N.C.C. Report* 302. Joint Nature Conservation Committee Peterborough.

Seaward, M.R.D. (1982) Yorkshire's Role in the Origin of some National Societies. *The Naturalist* 107, 117-138.

Sheail, J. (1988) *Seventy-five years in Ecology – the British Ecological Society.* Blackwell Scientific Publishers, Oxford.

Valentine, D.H. (1961) The Future of the British Flora. *The Naturalist* 86, 3-10.

Walters, S.M. (1951) The Study of Plant Distribution in Lousley, J.E., Ed. *The study of the distribution of British Plants.* Botanical Society of the British Isles, Oxford.

Warwick, S. (2008) Bird recording on a landscape scale in *Farmland Birds in Yorkshire,* report for Natural England, YNU and North & East Yorkshire Environmental Data Centre, York.

Wilmore, G.T.D., Lunn, J. & Rodwell, J.S. (2011) *The South Yorkshire Plant Atlas,* Yorkshire Naturalists' Union and North & East Yorkshire Environmental Data Centre, York.

Woodhead, T.W. (1923) Botanical Survey and Ecology in Yorkshire. *The Naturalist* 48, 97-123.

Woodhead, T.W. (1924) *The Study of Plants: An introduction to botany and plant ecology.* Oxford Clarendon Press.

Web References

Isaacs, N. (2012) NBN Conference http://nbn.org.uk/News/Latest-news/NBN-Conference-2012-review-and-presentations.aspx

Lawton, J. (2010) http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf

Mackay ,E. & Cham S. (2013) NBN Conference http://www.nbn.org.uk/News/Latest-news/NBN-Conference-report-and-presentations.aspx

http://publications.naturalengland.org.uk/publication/6415972705501184?category=6074729802760192

Additions and corrections to the Yorkshire Diptera list (part 5)

Andrew Grayson

56 Piercy End, Kirkbymoorside, York, North Yorkshire, YO62 6DF

The previous paper in this series is Grayson (2009). Regrettably, the forthcoming book on Yorkshire Diptera remains in preparation; however, as part of the celebrations to mark the YNU's 150th Anniversary, I have produced an Excel Spreadsheet entitled *A Simplified Provisional List of Yorkshire Diptera*, which is available via the YNU web-site. Taking into account all adjustments due to additions, corrections, species lost to synonymy and provisionally excluded, etc., the provisional Yorkshire Diptera list at 3.3.2013 contained 4272 species, including 1571 in the sub-order Nematocera. This is a net increase of 85 species to the list at 31.3.2008 (Grayson 2009).

Initials used below refer to the following: PJC = P.J. Chandler; JDC = J.D. Coldwell; PSC = P.S. Cranston; RC = R. Crossley; RHLD = R.H.L. Disney; CMD = C.M. Drake; WAE = W.A. Ely; AG = A. Grayson; PHL = P.H. Langton; LPR = L.P. Ruse; PS = P. Skidmore; DW = D. Whiteley; RSW = R.S. Wilson. Coll. = 'in the collection of', not 'collected by'.

The following abbreviations are used where material is held in institutions:
UMZCI = University Museum of Zoology, Cambridge;
DONMG = Doncaster Museum and Art Gallery;
NMS.Z = National Museums Scotland, Edinburgh;
KINCM = Hull and East Riding Museum, Hull;
BRFMS = Cliffe Castle Museum, Keighley;
LEEDM = Leeds Museum Discovery Centre;
MANCH = The Manchester Museum;
SHEFM = Weston Park Museum stores at Acres Hill, Sheffield.

Additions to Yorkshire Diptera List

MYCETOPHILIDAE
Anatella emergens Caspers: (63) Wortley Top Forge, SK2999, 22.8.2009 (♂), 26.9.2009 (♂) JDC.
Boletina pallidula Edwards: (63) Wortley Top Forge, SK2999, 22.4.2009 (♂), 1.7.2009 (♂) JDC.
Leptomorphus walkeri Curtis: (63) Wortley Top Forge, SK2999, 5.8.2009 (♂) JDC.
Trichonta pulchra Gagné: (63) Wortley Top Forge, SK2999, 16.8.2009 (♂) JDC.

CECIDOMYIIDAE
Macrolabis aquilegiae (Kieffer, 1909): (64) gall on *Aquilegia vulgaris* in Joyce Payne's garden at Cawood, T. Higginbottom, [photograph shown at YNU meeting in Doncaster on 13.10.2012].

CHIRONOMIDAE
Ablabesmyia longistyla Fittkau, 1962: (64) Gouthwaite Reservoir, 2008-2009 LPR; River Wharfe (Coll. RSW) (Langton, 1980: 444); Ribbleshead Moor (Coll. RSW) (Langton, 1980: 444); River Skirfare (Langton, 1980: 444).
Corynoneura gratias Schlee, 1968: (64) River Wharfe, SE052575, 16.8.1989 PHL.
Cricotopus curtus Hirvenoja, 1973: (64) Gouthwaite Reservoir, 2008-2009 LPR; (65) Bishopdale Beck, SD973838, 16.8.1989 PHL.
Cryptochironomus defectus (Kieffer, 1913): (64) Gouthwaite Reservoir, 2008-2009 LPR.
Nanocladius rectinervis (Kieffer, 1911): (64) River Wharfe (Coll. RSW) (Langton, 1980: 366).
Orthocladius rivinus Kieffer, 1915: (64) Gouthwaite Reservoir 2008-2009 LPR.
O. ruffoi Rossaro & Prato, 1991: (64) River Wharfe, SE052575 16.8.1989 PHL.
Pagastiella orophila (Edwards, 1929): (64) Gouthwaite Reservoir 2008-2009 LPR.
Paratanytarsus lauterborni (Kieffer, 1909): (64) River Wharfe, SE052575, 16.8.1989 PHL.
Paratrichocladius skirwithensis (Edwards, 1929): (64) River Wharfe (♂ Coll. PHL) (Langton, 1980: 413).
Rheocricotopus effusus (Walker, 1856): Langton (1980) stated that two Yorkshire sites are mentioned on page 34 of an unpublished 1979 Ph.D. thesis by PSC.
Rheopelopia ornata (Meigen): (64) Burley-in-Wharfedale, 7.1900 (2 specimens [NMS.Z) det. or teste PJC [in the genus *Conchapelopia*].

Rheotanytarsus pentapoda (Kieffer, 1909): (64) Gouthwaite Reservoir, 2008-2009 LPR; River Wharfe (Coll. RSW) (Langton 1980: 187): (65) Bishopdale Beck, SD973838, 16.8.1989 PHL.
Tanytarsus ejuncidus (Walker, 1856): (64) Gouthwaite Reservoir, 2008-2009 LPR.
Virgatanytarsus arduennensis (Goetghebuer, 1922): (64) River Wharfe, SE052575, 16.8.1989 PHL.

PLATYPEZIDAE
Agathomyia viduella (Zetterstedt, [1838]): (63) Silkstone, SE2906, 14.5.2012 (♂) JDC.

PHORIDAE
Megaselia picta (Lehmann, 1822): (63) Hampole Wood, 5.7.1978 PS det. RHLD [UMZCI].

PIPUNCULIDAE
Cephalops* (*Semicephalops*) *straminipes (Becker, 1900): (63) Old Moor, SE4202, 25.7.2012 (♂ [dissected]) JDC.
Eudorylas fusculus (Zetterstedt, 1844): (63) Stainborough Castle, SE3203, 2.7.2011 (♀) JDC.

PALLOPTERIDAE
Palloptera usta (Meigen, 1826): (63) Winscar Reservoir, SE1502, 21.6.20091 (♂) JDC.

LAUXANIIDAE
Homoneura patelliformis (Becker, 1895): (63) Manvers, SE4401, 24.6.2012 (♂) JDC.

AGROMYZIDAE
Cerodontha* (*Xenophytomyza*) *venturii Nowakowski, 1967: (63) ♂♂ were recorded by WAE from each of the following localities: fields south of Maltby Brick Works, SK5192, 29.5.1984; Quarry Hills, SK541901, 6.5.2000; Lindrick Dale Quarry (middle shelf), SK540821, 27.5.2000; Kilnhurst Ings (north of cross drain), SK465978, 7.6.2000; between south-east path and outlet stream of Wath-Manvers Lake, SE444021, 26.5.2001.
Liriomyza demeijerei Hering, 1930: (63) open area north-west of Fatty Boyns Pond 3, alongside British Rail lines, SK460956, 27.8.1988 WAE; Don Island, west of Centenary Way, SK421922, 22.6.2006 (♂) WAE.
L. erucifolii de Meijere, 1944: (63) ♂♂ were recorded by WAE from the north-eastern edge of the tip on the west of Treeton Dyke, SK436866, 6.9.2006.
L. ptarmicae de Meijere, 1925: (63) Wickersley Wood, SK484914, 30.8.2005 WAE.
Ophiomyia pulicaria (Meigen, 1830): (63) Norwood Locks (at second lowest lock, SK472820, 26.7.1980 WAE; woodland at west of Kiveton landfill site, SK502828, 1.7.2004 (♂) WAE; Austen Park (south of footpath), SK460852, 1.9.2006 WAE. DONMAG contains material tentatively identified as this species by PS, *viz.* a mine in *Sonchus arvensis* from Sandall Beat on 27.8.1968 leg. PS [in the Herbarium], and a ♀ from Brecks Plantation, Kirk Sandall, 4.7.1978 leg. PS [in the main Diptera collection].
Phytomyza albipennis Fallén, 1823: (63) Dodworth, SE3105, 21.5.2012 (♂♀), 26.5.2012 (2♂), 28.5.2012 (♀), 4.6.2012 (♂), 9.6.2012 (♂ [dissected]), 19.6.2012 (♀) JDC.

DROSOPHILIDAE
Lordiphosa acuminata (Collin, 1952): (63) Old Moor, SE4202, 8.9.2012 (♀) JDC.

EPHYDRIDAE
Hydrellia subalbiceps Collin, 1966: (62) Ashberry Pasture, 8.6.1980 WAE; (63) Thrybergh Country Park (west arm), 1.8.1984 WAE; (65) Colsterdale, SE1280, 20.6.1981 WAE.

Notiphila guttiventris Stenhammar, 1844: (63) Old Moor, SE4202, 25.7.2012 (♂) JDC.
Ochthera manicata (Fabricius, 1794): (63) Old Moor, SE4202, 22.9.2012 (♂ [dissected]) JDC.

CALLIPHORIDAE
Angioneura acerba (Meigen, 1838): (63) Adwick Washland, SE4702, 11.8.2012 (2♂) JDC; Dodworth, SE3005, 10.8.2011 (♂), 25.9.2011 (♂) JDC; Old Moor, SE4202, 2.6.2012 (♂) JDC.

TACHINIDAE
Actia lamia (Meigen, 1838): (63) Carlton Marsh, SE3709, 28.5.2012 (♀) JDC; Langsett, SE1900, 13.8.2011 (♀) JDC; Rabbit Ings, SE3711, 27.6.2012 (♂) JDC; Winscar Reservoir, SE1502, 3.7.2011 (♀) JDC.
Siphona confusa Mesnil, 1961: (63) Huthwaite, SE2700, 15.4.2011 (♂) JDC.
Sturmia bella (Meigen, 1824): (63) Scout Dike, SE2304, 28.9.2011 (♀) JDC.
Zophomyia temula (Scopoli, 1763): (63) Lindholme Hall Estate, SE707064, 10.6.2011 (♀) AG.

Re-instatements to Yorkshire Diptera List
CHIRONOMIDAE
Parachironomus biannulatus (Staeger, 1839): (64) Gouthwaite Reservoir, 2008-2009 LPR. Formerly excluded by Grayson (2006c).

SYRPHIDAE
Eupeodes (Lapposyrphus) lapponicus (Zetterstedt, [1838]): (63) Endcliffe Park Wood, Sheffield (teste DW) (DW, *pers. comm.*). Formerly excluded by Grayson (2006b).

TEPHRITIDAE
Campiglossa malaris (Séguy, 1934) [= *lhommei* Hering, 1936]: (63) Old Moor, SE4202, 12.6.2012 (♂) JDC; Rabbit Ings, SE3711, 23.7.2012 (♂) JDC. Formerly excluded by Grayson (2006b).

Exclusions from the Yorkshire Diptera List
Published Yorkshire Diptera include some species stated by authors as being not identified with certainty [e.g. with a '?', notes such as 'possibly', 'requires confirmation', etc.], and for which there have been no further Yorkshire records nor subsequent verification of material. Such species are best provisionally excluded from the county list pending verification of their occurrence. These species, and where they were published as occurring in Yorkshire, are as follows: MYCETOPHILIDAE: *Mycomya* (*Mycomya*) *trivittata* (Zetterstedt, [1838]) (Grayson, 2006); CECIDOMYIIDAE: *Geocrypta campanulae* (Müller, 1871) [= *trachelii* (Wachtl, 1885)] (Falconer, 1918 [sub nom. *trachelii*]); PIPUNCULIDAE: *Claraeola melanostola* (Becker, 1898) (Cheetham, 1947); *Dorylomorpha* (*Dorylomorpha*) *rufipes* (Meigen, 1824) (Barnes, 1938); PSILIDAE: *Chamaepsila* (*Chamaepsila*) *luteola* (Collin, 1944) (Grayson, 2006); EPHYDRIDAE: *Hydrellia flaviceps* (Meigen, 1830) [= *discors* Collin, 1966] (Skidmore, 2006); *H. ischiaca* Loew, 1862 (Skidmore, 2006); *Notiphila* (*Notiphila*) *graecula* Becker, 1926 (Skidmore, 2006).

LIMONIIDAE
Dicranomyia (Idiopyga) stigmatica (Meigen, 1830). Added to the Yorkshire list by Ashworth and Cheetham (1920) with several subsequent records, but this scarce cranefly now requires confirmation from Yorkshire as specimens determined before Stubbs (1998) may refer to *D.* (*I.*) *nigristigma* (RC, pers. comm.). Specimens re-examined to date have proved to be *nigristigma*.
Scleroprocta pentagonalis (Loew, 1873) [= *sororcula* sensu (Edwards, 1938)]. This rare cranefly requires confirmation as a Yorkshire species. It was added by Cheetham (1922) on the basis of a

specimen from Bilsdale identified by Edwards, which Edwards (1938) referred to *S. danica* (Nielsen, 1923) [= *sororcula* (Zetterstedt, 1851)]. Subsequent confusion with the Yorkshire records has been caused by the application of Zetterstedt's name *sororcula* to both *Scleroprocta* species.

CERATOPOGONIDAE
Ceratopogonidae in DONMG were revised by PS in 1994. The following were presumably then re-identified as other species, as there are no extant specimens in DONMG: *Dasyhelea* (*Dicryptoscena*) *modesta* (Winnertz, 1852) (= *holosericea* sensu Edwards, 1926, nec (Meigen, 1804), published sub nom. *holosericea* in Skidmore (1977)) and *Forcipomyia* (*Trichohelea*) *tonnoiri* (Goetghebuer, 1920) (= *papilionivora* Edwards, 1923, published sub nom. *papilionivora* in Skidmore (1976)).

CHIRONOMIDAE
Anatopynia plumipes (Fries, 1823). Recorded from Ilkley, 21.3.1909, J.H. Ashworth (Ashworth & Cheetham, 1920). Edwards (1929) stated *A. plumipes* was recorded from Britain by some of the older authors but probably in error. Chandler (1998) listed it from Ireland but not Britain.

ASILIDAE
Dioctria oelandica (Linnaeus, 1758). The purported material, collected near Low Mill, Pickering, 5.1943, on H.M. Foster's microscope slide 64 [HM], is a ♂*Dioctria rufipes* (De Geer) (det. AG).

HYBOTIDAE
Euthyneura myricae Haliday in Walker, 1851. This species is only known from the original specimen from Dublin. The Yorkshire specimen mentioned by McLean (1988) was published as *Anthalia beatricella* sp. nov. by Chandler (1992) (I.F.G. McLean, pers. comm.).

DOLICHOPODIDAE
Aphrosylus raptor Haliday in Walker, 1851. Recorded from Yorkshire by d'Assis-Fonseca (1978) but this was presumably an interpretation error, as Chris Cheetham's record card says he collected it at Killy Begs [in County Donegal, Ireland] in August 1931. The voucher material [LEEDM] is *Aphrosylus celtiber* Haliday, which was the original species name on Cheetham's record card for *A. raptor* (RC, pers. comm.).
Hercostomus nigriplantis (Stannius, 1831). Reference to material "from a Yorkshire site" in Drake (2011) was an error (CMD, pers. comm.).
Thinophilus flavipalpis (Zetterstedt, 1843) and *T. ruficornis* (Haliday, 1838) are restricted to saltmarshes and have not been found as far north as Yorkshire (RC, pers. comm.). *T. flavipalpis* was recorded from Yorkshire in d'Assis-Fonseca (1978) but this was presumably an interpretation error, as Cheetham's record card contains only a non-Yorkshire record from 'H. Hd'. This refers to Humphrey Head which lies north of Grange-over-Sands in Cumbria (RC, pers. comm.). A 1978 record of *T. ruficornis* from moorland in VC64 is undoubtedly erroneous.

LONCHAEIDAE
Lonchaea contigua Collin, 1953 and ***L. scutellaris*** Rondani, 1874 were listed from Yorkshire in MacGowan & Rotheray (2008) but possibly in error, as there are no Yorkshire records on Iain MacGowan's database (I. MacGowan, pers. comm.). Provisional exclusion seems appropriate.

PHORIDAE

Megaselia nasoni (Malloch, 1914). Wording in Disney (1999) leaves the reader unclear as to whether this species has been recorded from Yorkshire. It would appear not to have been, as there are no Yorkshire specimens in Henry Disney's collection [UMZCI] [main collection checked by AG: duplicate collection checked by RHLD].

SYRPHIDAE

Cheilosia carbonaria Egger, 1860. A record from Pickering in Cheetham (1941) [which cites the author as Loew, not Egger] was presumably a transcription or typographical error for another species. There is no Cheetham record card for *C. carbonaria* and there are no Cheetham *Cheilosia* records from Pickering that are unaccounted for on his cards.

Eristalis cryptarum (Fabricius, 1794). Anderson (2007) recorded this rare British species from Sleights on 20.9.2006 but in error, as the two specimens [det. AG] were males of the common species *E. arbustorum* (Linnaeus, 1758) and *E. pertinax* (Scopoli, 1763).

SEPSIDAE

Themira nigricornis (Meigen, 1826) [= *fallenii* (Staeger in Schiødte, 1844)]. Listed by Grimshaw (1907) [sub nom. *fallenii*] from Burley-in-Wharfedale, 8.1893. The material was presumably later reidentified as a different species. Grimshaw's *Themira* with this data [NSM.Z] is currently standing under three species, viz. *T. leachi* (Meigen, 1826), *T. putris* (Linnaeus, 1758) and *T. lucida* (Staeger in Schiødte, 1844).

OPOMYZIDAE

Geomyza majuscula (Loew, 1864). Records from Manvers (Coldwell, 1999) and Little Don Valley in 1999, JDC, are erroneous (JDC, pers. comm.).

EPHYDRIDAE

Philygria interrupta (Haliday, 1833). The record from Cotterdale (Grayson, 2009) now needs clarification, as CMD notes there are diagnostic problems with clear winged *Philygria* (J.H. Cole, *pers. comm.*). Jon Cole is unsure of which species the Cotterdale specimen is.

HIPPOBOSCIDAE

Hippobosca equina Linnaeus, 1758. Stated by Walsh (1956) to be 'Occasional' in the Scarborough district but the source for the statement was considered unreliable by Grayson (2004).

TACHINIDAE

Gonia divisa Meigen, 1826. Listed from Potteric Carr in Bateson (2002, 2002a) but the specimen was lost due to pest damage and the record was withdrawn (D. Bateson, pers. comm.) as it was likely to have been erroneous.

OESTRIDAE

Hypoderma lineatum (De Villers, 1789). This species probably occurred in Yorkshire prior to its extinction in Britain as a result of a warble-fly eradication programme initiated in 1978; however, the records are untrustworthy; furthermore, Tarry (1981) failed to find larval evidence of *H. lineatum* in Yorkshire cattle during 1979 (Grayson, 2004).

Oestrus ovis Linnaeus, 1758. This, the Sheep Nostril Fly, was stated by Walsh (1956) to be 'Local and Occasional' in the Scarborough district but the source used for the statement was considered unreliable by Grayson (2004).

Further Notes

The following species would be new to the county list if material standing under these names, or synonyms, in museum collections were authentic and the records were published; however, further investigation is required as identifications have been queried by the determiners [either written so on identification label or via A.R. Godfrey, pers. comm.]. They are provisionally excluded from the county list until identifications are verified. KEROPLATIDAE: *Macrocera inversa* Loew [SHEFM]: MYCETOPHILIDAE: *Mycomya* (*Mycomyopsis*) *maura* (Walker) [LEEDM]: CERATOPOGONIDAE: *Culicoides* (*Beltranmyia*) *machardyi* Campbell & Pelham-Clinton, 1960 [DONMG]: CHIRONOMIDAE: *Kiefferulus tendipediformis* (Goetghebuer, 1921) [DONMG]; *Metriocnemus hirticollis* sensu Edwards, 1929 nec (Staeger, 1839) [DONMG]; *Pseudorthocladius curtistylus* (Goetghebuer, 1921) [LEEDM: cabinet R4]; *Pseudosmittia forcipata* (Goetghebuer, 1921) [DONMG]; *Rheotanytarsus muscicola* Thienemann, 1929 [DONMG]; *Thalassosmittia thalassophila* (Bequaert & Goetghebuer, 1913) [DONMG]: PIPUNCULIDAE: *Pipunculus elegans* Egger, 1860 [sub nom. *spinipes* sensu auctt. nec Meigen, 1830] [BRFMS]: CLUSIIDAE: *Clusiodes caledonicus* (Collin, 1912) [DONMG]; *C. nubila* (Meigen, 1830) [LEEDM]: AGROMYZIDAE: *Agromyza intermittens* (Becker, 1907) [DONMG]; *Aulagromyza buhri* (de Meijere, 1938) [BRFMS & DONMG]; *Hexomyza sarothamni* (Hendel, 1923) [DONMG]; *Melanagromyza sativae* Spencer, 1957 [DONMG]; *M. symphyti* Griffiths, 1963 [DONMG]; *Phytobia errans* (Meigen, 1830) [DONMG]: SPHAEROCERIDAE: *Minilimosina* (*Allolimosina*) *secundaria* (Duda, 1918) [DONMG]; *Puncticorpus cribratum* (Villeneuve, 1918) [DONMG]: EPHYDRIDAE: *Philotelma defectum* (Haliday, 1833) [BRFMS]; *Scatella obsoleta* Loew, 1861 [SHEFM]: ANTHOMYIIDAE: *Botanophila dissecta* (Meigen, 1826) [DONMG]; *Delia coronariae* (Hendel, 1925) [SHEFM]; *D. pallipennis* (Zetterstedt, [1838]) [MANCH]; *D. setigera* (Stein, 1920) [sub nom. *fennica* (Karl, 1930)] [DONMG & SHEFM]; *Pegomya seitenstettensis* (Strobl, 1880) [DONMG]; *Pegoplata debilis* (Stein, 1916) [MANCH]: FANNIIDAE: *Fannia atra* (Stein, 1895) [DONMG]; *F. carbonaria* (Meigen, 1826) [LEEDM]; *F. metallipennis* (Zetterstedt, [1838]) [SHEFM]; *F. subpubescens* Collin, 1958 [DONMG & SHEFM]: MUSCIDAE: *Coenosia flavimana* (Zetterstedt, 1845) [MANCH]; *Helina intermedia* (Villeneuve, 1899) [DONMG]; *Hydrotaea capensis* (Wiedemann, 1818) [BRFMS]; *Limnophora nigripes* (Robineau-Desvoidy, 1830) [LEEDM]: CALLIPHORIDAE: *Calliphora stelviana* (Brauer & von Bergenstamm, 1891) [sub nom. *alpina* sensu auctt., nec (Zetterstedt, [1838]) [DONMG]; *Phormia regina* (Meigen, 1826) [SHEFM]: TACHINIDAE: *Eurithia caesia* (Fallén, 1810) [LEEDM].

The following species are recorded in Doncaster Museum Data Bank [card index in DONMG] and would be new to the county list if published; however, some of the records are tentative and none are supported by specimens in the DONMG collection: PHORIDAE: *Megaselia involuta* (Wood, 1910); *M. nigrescens* (Wood, 1910); *M. pallidizona* (Lundbeck, 1920): AGROMYZIDAE: *Calycomyza humeralis* (von Roser, 1840): SCATHOPHAGIDAE: *Hydromyza livens* (Fabricius, 1794): ANTHOMYIIDAE: *Pegomya incisiva* (Stein, 1906).

CERATOPOGONIDAE

Bezzia kazlauskasi Remm, 1966. Recorded by Chandler *et al.* (2008) from the modern county of "Durham: Middleton-in-Teesdale, 21.vi.1981, 1♀ PJC". The locality is at the VC65/66 border and the specimen may have been from VC65 (PJC, pers. comm.).

DOLICHOPODIDAE

Rhaphium fascipes (Meigen, 1824) [= *latipes* (Macquart, 1827)]. Excluded in Grayson (2006b). It was also recorded by Meade (1850) [sub nom. *Porphyrops latipes*] but probably in error. The

only *Rhaphium* amongst Meade's Dolichopodidae [LEEDM: cabinet R7] is the remnants of a specimen with no locality label, identified [not by Meade] as *R. caliginosum* Meigen.

Acknowledgements

This paper would not have been possible without information and co-operation from the following: The late Marjorie Anderson, Derek Bateson, Peter Chandler, John Coldwell, Jon Cole, Roy Crossley, Martin Drake, Bill Ely, Andy Godfrey, Tom Higginbottom, Peter Langton, Iain MacGowan, Ian McLean, Les Ruse and Derek Whiteley. Most of the references to museums in this paper relate to visits made by the author several years ago and for which acknowledgements for facilitating access were published in previous papers. New acknowledgements are necessary to Keith Bland, Graham Rotheray and Richard Lyszkowsky [National Museums Scotland, Edinburgh], Henry Disney [University Museum of Zoology, Cambridge] and Paula Gentil [Hull and East Riding Museum, Hull].

References

Anderson, M. ([2007]) Entomology Recorder's Report. *Whitby Naturalists' Club Annual Report* (2006): 42-52.

Ashworth, J.H. & Cheetham, C.A. (1920) Additions to Yorkshire Diptera. *The Naturalist* 45: 227-234.

d'Assis-Fonseca, E.C.M. (1978) Diptera: Orthorrhapha: Brachycera: Dolichopodidae. *Handbooks for the Identification of British Insects* 9 (5).

Barnes, M.D. (1938) Meeting of Yorkshire Entomologists at Askern. *The Naturalist* 63: 286-288.

Bateson, D. (2002) *Wildlife communities inhabiting Loversall Delph: A report on an 18 months study of Loversall Delph and surrounding area*. Yorkshire Wildlife Trust Potteric Carr Nature Reserve.

Bateson, D. (2002a) Loversall Delph: A Wildlife Jewel at Potteric Carr. *The Sorby Record* 38: 2-47.

Chandler, P.J. (1992) *Anthalia beatricella* sp. n. and two other additions to the British list of Oedaleini (Diptera, Empididae). *Dipterists Digest* [first series] 12: 16-22.

Chandler, P.J. (editor) (1998) Checklists of Insects of the British Isles (New Series) Part 1: Diptera. *Handbooks for the Identification of British Insects* 12 (1).

Chandler, P.J., Ashe, P. & O'Connor, J.P. (2008) Notes on Ceratopogonidae (Diptera) including some new national records for Britain and Ireland. *Dipterists Digest* (Second Series) 15: 73-94.

Cheetham, C.A. (1922) Additions to Yorkshire Diptera List. *The Naturalist* 47: 381-382.

Cheetham, C.A.] (1941) Yorkshire Naturalists' Union at Pickering. *The Naturalist* 66: 251.

Cheetham, C.A. (1947) Diptera. *In* Yorkshire Naturalists' Union Excursions in 1947: Slingsby, July 5th. *The Naturalist* 72: 174.

Coldwell, J.D. (1999) Insects of the Barnsley Area. *Sorby Record Special Series* 12.

Coldwell, J.D. (2011) Diptera new to Yorkshire from the Barnsley area in 2010. *The Naturalist* 136: 159-160.

Disney, R.H.L. (1999) A troublesome sibling species complex of scuttle flies (Diptera: Phoridae) revisited. *Journal of Natural History* 33 (8): 1159-1216.

Drake, C.M. (2011) Does *Hercostomus nigriplantis* include two species? *Empidid & Dolichopodid Recording Scheme Newsletter* 16: 5.

Edwards, F.W. (1929) British Non-biting Midges (Diptera, Chironomidae). *The Transactions of the Entomological Society of London* 77: 279-430.

Edwards, F.W. (1938) British Short-palped Crane-flies: Taxonomy of Adults. *The Transactions of the Society for British Entomology* 5: 1-168.

Falconer, W. (1918) Plant Galls of the Huddersfield District. *The Naturalist* 43: 166-168.

Grayson, A. (2004) On the inadequacy of the Yorkshire Naturalists' Union's records of Yorkshire bot-flies and warble-flies etc. (Diptera: Oestridae), including ecological and other annotations. *Bulletin of the Yorkshire Naturalists' Union* 42: 1-12.

Grayson, A. ([2006]). Entomological Report for 2005. *In* Recorders' Reports. *Ryedale Natural History Society Newsletter* (2005): 22-25.

Grayson, A. (2006a). New Yorkshire Mycetophilidae and Agromyzidae (Diptera). *Bulletin of the Yorkshire Naturalists' Union* 46: 37-42.

Grayson, A. (2006b) Additions and corrections to the Yorkshire Diptera list (Part 2). *The Naturalist* 131: 83-93.

Grayson, A. (2006c) Additions and corrections to the Yorkshire Diptera list (Part 3). *The Naturalist* 131: 131-138.

Grayson, A. (2009) Additions and corrections to the Yorkshire Diptera list (Part 4). *The Naturalist* 134: 24-29.

Grimshaw, P.H. (1907) Diptera. *In* Page W. (editor) (1907) *The Victoria History of the Counties of England: A History of Yorkshire in Nine Volumes*: 1: Zoology: Insects. London: Archibald Constable. pp. 277-285.

Langton, P.H. (1980) *Taxonomy and biology of some British Chironomidae*. Unpublished Ph.D. thesis.

MacGowan, I. & Rotheray, G. [E.] (2008) British Lonchaeidae: Diptera Cyclorrhapha, Acalyptratae. *Handbooks for the Identification of British Insects* 10 (15).

McLean, I.F.G. (1988) 26 May 1988. *In* Indoor Meetings. *British Journal of Entomology and Natural History* 1: 178-179.

Meade, R.H. (1850) Observations on the study of Dipterous Insects. *In* Insects. *The Zoologist* 8: 2959-2960.

Skidmore, P. (1976) Diptera. *In* Entomological Reports for 1974. *The Naturalist* 101: 30-34.

Skidmore, P. (1977) Diptera. *In* Entomological Reports for 1975-76. *The Naturalist* 102: 77-81.

Skidmore, P. (2006) An Inventory of the Invertebrates of Thorne and Hatfield Moors. *Thorne & Hatfield Moors Monograph* 2. Thorne and Hatfield Moors Conservation Forum, Doncaster.

Stubbs, A.E. (1998) *Test Key to Subfamily Limoniidae*. Cranefly Recording Scheme.

Tarry, D.W. (1981) Distribution of cattle Warble flies in Britain: A larval survey. *In* Papers and Articles. *The Veterinary Record* 108: 69-72.

Walsh, G.B. (1956) Order Diptera - Two-winged Flies. *In* Walsh, G.B. & Rimington, F.C. (1956). *The Natural History of the Scarborough District* 2 (Zoology): 288-312. Scarborough: Scarborough Field Naturalists' Society.

YNU Notice - Union publications

If you have not received your copy of *The Naturalist* 1084 or the *Yorkshire Bird Report 2011* please contact the YNU Membership Secretary, c/o NEYEDC, St William's College York YO1 7JF or email: membership@ynu.org.uk

Woodland in the Yorkshire Dales: A Case Study

Michael Pearson
email: michaelpearson@austwick.org

Introduction

Less than 5% of the Yorkshire Dales National Park (YDNP) is covered in woodland according to the YDNP Authority and this figure is reduced to below 3% when the conifer plantations are excluded. Nevertheless, trees and woodland are significant components of the Dales landscape and are of disproportionate importance when considering the botanical diversity of the area.

Was there more woodland in the Dales in the past and, if so, when did the decline begin? To explore these and related questions it is useful to examine a limited area in some detail. The area selected is the civil parish of Austwick, an area of more than eight thousand acres on the southern edge of the YDNP. It is c.13 km from Austwick Common in the south to Lord's Seat on Simon Fell in the north and extends 3.5km east from Thwaite Scars in the west. It is diverse geologically with no single soil type dominating the landscape, which rises from 130m to a height of 630m. The importance of the area is recognised by the designation of several SSSIs.

This study involves an examination of the historical evidence for woodland in Austwick and a comparison with a survey of current woodland in the area.

Documentary evidence

Although Austwick was recorded in the Domesday survey of 1086 there was no reference to there being any woodland. The earliest evidence for the existence of woodland is to be found in Peter Yorke's 'Lordship Customes' of 1573[1]. In this document he, as lord of the manor, recognised that his tenants had the right "of oake for building and repairing of fire houses and barnes when a need did require, and also necessarie boughboote and ploughboote was had ... [from] woods of ye said manor". Bote or boote was used to indicate a right to take wood only for a specific purpose. Thus 'ploughboote' was timber or wood allowed to a tenant for the repair of ploughs and other farm tools. 'Boughboote' was the right to smaller branches of a tree, implying the end of the branch terminating in twigs (Wright, 1898). Unfortunately the document gives no clues as to the location of these woods.

In the 17th century the Manor Court Book provides the first record of Austwick Wood. In 1682 orders were issued for the "fence lying betwixt Austwick Wood and daleland ... be made sufficient"[2]. In the same year the Court Book recorded "occupiers of a parcel of ground called Grimsinge lying on the North side of the River beneath Hardenbridge that they shall sufficiently cut up all Roots, Boughs and superfluous branches out of the same River which letteth Stopeth & causeth the said water to turn out of its course to the great

damage & detriment both of the highway and several adjoining neighbours."

The will of Thomas Armitstead, who died in 1691, refers to a Melding Wood amongst his land in Austwick as well as rents from Oxenber. Although Meldings Barn appears on the OS map there is no longer any trace of a wood. Melding was listed as field 737 in the Tithe Schedule of 1851 but was classified as pasture. It appears that the wood disappeared prior to the middle of the 18th century.

Probate inventories of the time provide valuations of timber. For example, the inventory of William Bankes, who died in 1696, noted "one fullen Oake Tree' valued at £2. Christopher Richardson, who died in 1684, had "whole timber loosewood and all other hustlement" valued at 15 shillings. In 1648 John Clapham owned "3 pieces of wood" valued at 1s 6d. These scant records provide no evidence as to the use of this timber and wood.[3]

The record of the boundaries for the manor in 1792 provides topographical details for the historian. The "little wood at the south side of the said field" equates to the existing wood at Blaithwaite, west of Armitstead.[4]

A record has survived from 1702 of the sale of 303 trees from Margaret Ingleby to local tanners. It is not clear how many came from Austwick as the document states that 27 trees were from neighbouring Lawkland wood.[5]

A fragment of the Austwick Wood account book for the period 1854 to 1860 has survived. It provides a few details of interest. In 1857 the rent received for herbage amounted to 5 shillings per acre. It is not clear whether this was for grazing or for the cutting of fodder. In the same year payment of £1 2s was received for stubbing of $16^1/_2$ rods at 16d per rod. Stubbs were intermediate between coppice and pollards though the term was also used for both (Rackham, 2003). In 1858 17 shillings was paid for cutting briars in the wood. The management of the woodland was thus not limited to grazing and harvesting of the wood but also included some control of weeds.[6]

Of the three woods identified as existing prior to the middle of the 18th century only two have survived. Oak was the only tree identified and there is limited evidence for the use of the wood. Presumably it was used for heating, cooking, building, fencing and so on. It was also exported to the tanners of nearby Settle. It may have also been used as a fuel for the limekilns, of which there were several within the parish.

The Tithe Survey

For centuries tithes were collected in kind so that a notional tenth of a wheat harvest was paid by a farmer to the tithe owner. This changed in 1836 with the passing of the Tithe Commutation Act and a fluctuating money payment, the tithe rent-charge, was substituted. This was adjusted each year on the basis of a seven-year average price of wheat, barley and oats. The first stage was for tithe owners and tithe payers to agree a value for the rent-

charge on a voluntary basis. If this was not possible an assistant tithe commissioner was empowered to hold a local enquiry, to draft an award, hear objections and finally confirm an award which was then binding on all involved. The enquiry entailed a survey of the land with the production of a schedule and a map (often to the scale of three chains to an inch or 26.7 inches to a mile).

In the case of Austwick the survey for the tithe map was undertaken in 1847 with the schedule completed in 1851. The work was supervised by John Rawlinson as assistant tithe commissioner. The schedule lists the owners, tenants, areas of each field, often with their names as well as the use of the land. Each area was allocated a number which corresponded to those on the map.[7] It was estimated that the total area of Austwick was 8201 acres of which 151 acres was arable, 4800 acres was inclosed meadow or pasture, 1200 acres was open stinted pasture (a stint was a pasture right based on a fixed number of animals which was agreed locally), 2000 acres was uncultivated moor and just 30 acres was woodland. Public highways accounted for the remaining 20 acres. A number of researchers have questioned the accuracy of the schedule summaries as the estimates were not always calculated from the summation of the areas of each individual plot (Kain & Prince, 2000).

As the areas of open stinted pasture and uncultivated moor were not included in the schedule for Austwick it was not possible to check the total area by adding up each plot. Instead the total area was calculated from recent OS maps, which gave a total area of 8006 acres or a difference of 2.4%. Thus the tithe schedule total area appears reasonably accurate. Working from the schedule the total area identified as woodland equates to a total of just over 83 acres. This is considerably higher than the 30 acres estimated in the summary and only about 1% of the total area.

It is possible to identify all the wooded areas within the parish by undertaking a detailed comparison of the map with the schedule. It emerged that some of the enclosed and open stinted pasture was in fact wooded. For example, Car Mire Wood (field 355) was classified as pasture. In other words the tithe commissioner classified what was wood-pasture as pasture rather than woodland. From a taxation standpoint the grazing was more important than the timber or wood. This underestimation of woodland is most significant in the case of Oxenber. This historic wood-pasture was classified in the schedule as stinted pasture. The combined areas of Oxenber and Wharfe woods is 218 acres so, with the 83 acres previously identified, the area of woodland equates to 3.6% of the parish.

Even this is an underestimate of the extent of the woodland. Careful examination of the map shows that there were woods within enclosed fields. For example, Whitestones was classified as pasture on the schedule but the map shows Whitestone Wood within it. Other examples include Gelder Leys Low Pasture (field 669), Waters House Pasture (1112), Jackson Close (1128), Laneside Croft (1411) and the Quarry Ground (375).

In the case of Gill Wood the map shows trees extending into the neighbouring fields of

Fiddle Meadow and Foregill (pasture) but this is not recorded in the schedule. Finally the map shows the area of Hobson Gill north to Throstlenest Wood as being wooded but this does not appear on the schedule. From the map it is possible to identify 53 areas of woodland, though 40 of these were less than an acre. The woodlands of 5 or more acres include Austwick Hall Wood, Bowser Plantation, Christopher Hill (Lawsings) Plantation, Car Mire Wood, Birks Plantation, Oxenber and Wharfe Wood.

Present Woodland

Having established what woodland existed in the middle of the 19th century it is possible to see how much has survived to the present day. Conversely, there may have been woodland planted during the same period. So what changes have occurred over the last 160 years?

By a combination of field work and comparisons with modern maps it was possible to undertake a census of woodland within the parish. Although some indication of tree species is provided no attempt was made to undertake a comprehensive botanical survey of the woodland. The initial focus was on woodland of 5 acres or more, followed by those woods lost since the tithe survey, new plantings and finally those areas which may have existed at the time of the survey but which were not recorded as woodland.

Oxenber/ Wharfe Woods. Both these woods are historic wood-pasture and are designated SSSIs. The tree cover is not continuous with three extensive areas of limestone pavement. The predominant trees are Ash F*raxinus excelsior*, Hazel *Corylus avellana* and Hawthorn *Crataegus monogyna*. On the more acidic soils in the northern part of Wharfe Wood birch, Hazel, Rowan *Sorbus aucuparia* and Holly *Ilex aquifolium* predominate. Woodland shrubs such as Spindle *Euonymus europaeus* and Dogwood *Cornus sanguinea* have been found on the crags and may represent an ungrazed relic of ancient woodland. Although described as wood pasture there is little evidence of pollarding. Instead coppicing appears to have been practiced. This would have required either very low stocking levels or alternatively temporary enclosure to protect the coppice stools from grazing. The extent of these woodlands remains unchanged from the tithe map.

Austwick Hall Wood. Although Ash and Sycamore *Acer pseudoplatanus* dominate the canopy, many other trees are found in small numbers, such as Beech *Fagus sylvatica*, Field Maple *Acer campestre*, lime, Yew *Taxus baccata*, Scots Pine *Pinus sylvestris*, larch, elm, Bird Cherry *Prunus padus*, Hawthorn and Blackthorn *Prunus spinosa*. In the area nearest the Hall there are trees planted from the mid-19th century onwards, such as Douglas Fir *Pseudotsuga menziesii*, Wellingtonia *Sequoiadendron giganteum*, Beech and oaks. There is evidence of quarrying within the wood as well as areas of limestone pavement. For a wood planted in 1846/7, just prior to the survey, it has an unexpectedly rich ground flora. The extent of woodland remains unchanged since the tithe survey.

Bowser. This is a 7 acre conifer plantation, though it has probably been replanted since the tithe survey.

Christopher Hill (Lawsings) Plantation. This is now reduced to about a fifth of its original size and is limited to conifers.

Car Mire Wood. This 7 acre wood-pasture has disappeared since the tithe survey. Although adjoining Oxenber it was privately owned rather than being stinted.
Birks Plantation. This 13 acre woodland has been felled since the tithe survey and is now pasture. However, an adjoining area, Brow Side, has been planted as a conifer plantation.

Thus, some 28 acres have been lost from the larger woods that existed at the time of the tithe survey: approximately 10% of the total. Only three of the smaller areas of woodland identified from the tithe survey have since disappeared. One was field 1123 and was less than an acre in area. However it was next to Black Plantation, a mixed wood of just over an acre. Another was field 111, near Sowerthwaite Farm, which was less than a quarter of an acre. A similar-sized wood (field 377) on the edge of Oxenber has also been cleared. Thus, a total of 29.5 acres has been lost since the 19th century.

Recent Woodland

As mentioned above, there is evidence that woodland has appeared since the tithe survey. The largest is Brow Side Plantation, a conifer wood extending to c.250 acres, although only about 225 acres lie within the parish boundary. The survival of a thin strip of broadleaved woodland along the edges of the gill that runs through it is of particular interest.

In the 18th century Austwick Moss was used for turbary, divided into dales or strips each allocated to residents and landowners in Austwick. Peat cutting probably ceased by the end of the 19th century and since then the area has been colonised by trees (Cheetham, 1945). Creeping Willow *Salix repens*, Bay Willow *S. pentandra*, Rusty Willow *S. cinerea oleifolia*, Downy Birch *Betula pubescens*, Rowan, Hawthorn and Alder *Alnus glutinosa* have all become established. The birch predominates in the drier areas and the willows in the wetter parts, although in the larger area of woodland Alder replaces the birch. This SSSI covers an area of nearly 100 acres.

Finally, three other small areas were planted in the latter half of the 19th century: Long Tram, New Close and Dear Bought Plantations. The first two were planted in 1874 and the last in 1865 by T. R. Clapham, who lived at Austwick Hall. In total they cover 3.5 acres and consist of sixteen species of trees. They appear to have been planted partly for shelter but also as cover for game birds.

Relict Woodland

As one ventures north into Crummack Dale one moves into extensive areas of moorland and stinted pasture. These areas were excluded from the tithe survey and so there are no records of woodland. However, it is clear that the landscape was not treeless. The colony of Junipers *Juniperus communis* at Moughton existed at the time of the tithe survey: the earliest record of them dates from 1746 (Lees, 1888). Ash, Hawthorn and Elder *Sambucus niger* have become established in the surrounding limestone pavement where they have escaped the attention of grazing sheep. Elsewhere in Crummack Dale are c.14 small groups of trees, some along the sides of becks, amongst limestone pavement or on the cliffs. For

example, Hawthorn, Hazel and Elder cling onto the steep sides of Robin Proctor's Scar. Elsewhere Ash, Rowan and Hawthorn appear to be the commonest trees among limestone pavement. Recently areas below scars have been fenced with trees planted to join the remnants of what may have been woodland.

In other parts of the parish where there are steep-sided gills it appears that trees have survived the grazing of cattle and sheep. For example, Wharfe Gill Sike and Hobson's Gill have Hawthorn, Ash, Sycamore, Alder, birch, Holly and Rowan which appear to have existed in the 1850s, but not always recorded as such in the tithe survey.

Discussion

There have been very few studies combining historical research with field surveys of existing woods in the YDNP and these have been limited to Wensleydale, Swaledale and Nidderdale. These studies have shown that there are differences in the composition of woodland as well as marked differences between dales (Dormer, 2008). This variability is in part due to the geology, soils and elevation, other influences including the ownership, purpose and management of the woodlands. During the Middle Ages the two principal means of managing woodland were coppicing and wood-pasture. The latter provided a means of grazing animals and growing trees on the same land and was a system suited to combining hunting with wood production. Coppicing was the favoured form of management where it was more important to produce wood.

Dormer's study showed that the woods of Nidderdale and Wensleydale are quite different. Wensleydale is less wooded and such as exists is fragmented and in small blocks. The dale was a medieval hunting park with pollarded wood-pasture. However, much of Wensleydale's estate woodland had become forestry plantation for timber production by the early 19th century. On the contrary, Nidderdale had been predominantly monastic land managed by coppicing, which continued into the 19th century and was an important source of charcoal, firewood and so on.

The documentary evidence for medieval woodland in Swaledale is fragmentary (Gledhill, 2004). This landscape study showed that the upper dale was divided into a number of small units, each with a hamlet and associated walled common pasture. Lower Swaledale may also have once had its common wood-pastures but much of the woodland in this area was enclosed by the latter half of the medieval period. Gledhill concluded that most of the surviving woodland lay in the common cow-pastures which was subject to common rights. A smaller amount lay on tenanted land: very little was in the direct control of the lord of the manor. This would seem to be more in line with Austwick rather than the pattern observed in Nidderdale and Wensleydale.

In the mid 19th century the woodland in Austwick consisted of numerous small fragments of woods along with seven larger areas. These larger areas account for 271 acres or 90% of the total woodland, though noting the earlier caveat that the tithe survey underestimated

the total area covered by trees. The larger of these woods, Oxenber and Wharfe, were not under any single ownership, which may account for their survival. Further research may throw more light on the management of these areas and help to explain the diversity of their ground flora. For example, were areas enclosed to protect the young coppice shoots from grazing, providing a refuge for the re-colonisation of other areas? Another of the larger woodlands, Austwick Hall Wood, has survived to the present time. The land was of limited value for grazing and was probably planted for the pleasure of the landowner, Richard Clapham. It has been assumed that, as a keen amateur botanist, he had introduced much of the ground flora which has survived to this day. He may well have planted the Asarabacca *Asarum europaeum* and the Martagon Lilies *Lilium martagon*. Another possibility is that the limestone pavement flora within the wood re-colonised the area once the woodland was enclosed in 1846.

The small fragmentary woodland may be a reflection of the size of Victorian farms in the parish. From the 1851 census it has been calculated that 77% of the 39 farms listed were less than 100 acres (Pearson, 2013). Thus a tenant with a farm of 65 acres could not afford to devote too much land to woodland and that set aside for trees may have been marginal.

By 1851 the enclosure of Austwick was complete. It had probably started in the 16th century and was mostly achieved in a piecemeal fashion by farmers exchanging or buying land to consolidate their holdings. In addition, there had been two Enclosure Acts which affected Ingleborough and Moughton. With the rise in sheep rearing it is probable that any existing woodland would have been threatened: not so much through damage to existing trees but rather by preventing natural regeneration. The small numbers of trees hanging on in isolated pockets are mainly those that have evaded the grazing sheep.

Laurie (2012) recorded the trees on the cliffs and within the waterfall ravines of Swaledale and found Aspen *Populus tremula*, Yew and Large-leaved Lime *Tilia platyphyllos* but not Juniper. Yews in Austwick are restricted to Austwick Hall Wood and may have been deliberately planted. Aspen & Large-leaved Lime have not been found in the parish but Juniper still survives on Moughton. These differences may reflect the differential colonisation by these trees of northern Britain at different periods through post-glacial time (Godwin, 1975), influenced by differences in geology and other environmental factors.

England has 8.4% of its land area with woods of 0.1 hectares or more. The figure for Yorkshire and Humberside is 6.0% (Forestry Commission, 2001). Based on Ministry of Agriculture surveys the woodland cover for England was 4.9% in 1870. In the case of a single parish, Austwick, the present analysis shows that the woodland cover in the 1850s was 3.7% and has increased to 7.3% currently. This increase masks a loss of broadleaved woodland. There has been an extension of the area covered by conifer plantation as well as a smaller increase in the extent of broadleaved woodland, which was not the result of conscious planting but rather colonisation due to the cessation of peat cutting. Currently the area covered by broadleaves is about 4.5%.

In conclusion, the evidence for woodland in Austwick prior to the tithe survey is scant. Although trees were clearly part of the environment and the pre-industrial economy there are few details to reconstruct the areas covered by woodland. This may suggest that there was little woodland cover from at least the 11th century and the Domesday survey. It is not until the tithe survey that a more comprehensive analysis is possible and even then the evidence suggests that the extent of woodland was underestimated. Comparisons with the present time shows that several small woods have been cleared over the last 160 years but there has been an increase in the area covered by conifers and a smaller area colonised by broadleaves. It is not clear whether there has been any change in the areas of relict woods apart from the recent planting of native trees on adjoining land.

In summary, any loss of woodland would have had to have occurred prior to the middle of the 19th century and probably before the 11th century. The evidence for Austwick shows that, at least in this parish, the woodland cover increased between the 19th and 21st centuries in line with national trends.

References

Cheetham, C.A. (1945) Austwick moss. *The Naturalist* 70: 117-20.

Dormor, I. (2008) Tenure and purpose: two key determinants of woodland character in the Yorkshire Dales. in Atherden, M.A. & Milsom , T. (eds.) *Yorkshire landscapes past and present*. PLACE, York.

Forestry Commission (2001) *National inventory of woodland and trees, England*. Forestry Commission.

Gledhill, T. (2004) Woodland, industry and landscape: a history of woodland in Swaledale. In White, R.F. & Wilson, P.R. *Archaeology and historic landscapes of the Yorkshire Dales*. Yorkshire Archaeological Society.

Kain, R.J.P. & Prince, H.C. (2000) *Tithe surveys for historians*. Phillimore, Chichester.

Laurie, T. (2012) *Relict woodland on the cliffs and within the waterfall ravines of Swaledale – an introduction*. Conference: Trees beyond the wood. Sheffield.

Lees, F.A. (1888) *The flora of west Yorkshire*. Lovell Reeve, London.

Pearson, M.B. (2013) Austwick Hall: the economics of a Yorkshire Dales estate. *North Craven Heritage Trust Journal*: 6-9.

Rackham, O. (2003) *Ancient Woodland – its history, vegetation and uses in England.* Castlepoint Press, Dalbeattie.

Wright, J. (1898) *The English dialect dictionary*. Frowde, London.

Archive sources

1 Yorkshire Archaeological Society archives: MD 335/12

2 YAS DD91

3 Lancashire Records Office: WRWL Thomas Armitstead (1695), William Banks (1696), Christopher Richardson (1684), John Clapham (1648)

4 S. Lawrence archive, Austwick

5 S. Lawrence archive, Austwick

6 North Yorkshire Records Office PR/AUS/5/1

7 NYRO PR/CPM/5/2

A provisional vascular plant red data list for VC63 (S.W. Yorkshire) Field recording guidelines and field excursions - 2014

G.T.D. Wilmore
email: consultecol.wilmore@btinternet.com

Introduction

Wilmore (2013) announced details of a project which aims to produce a definitive Red Data Vascular Plant Register for VC63. That paper reviewed the selected list of candidate plant species derived from the author's personal experience over the last forty years, broken down under various heads: 1) natives; 2) natives presumed to be now extinct in the vice-county; 3) hybrids; 4) archaeophytes; 5) grey area species – native or Introduced and 6) unconfirmed. The paper concluded by indicating that it was proposed to commence active recording in 2013, when a range of selected plant species would be targeted.

The current paper seeks to provide field recording guidelines, list the selected (native) plants to be targeted in 2014, together with both historical and current locational details where known, and give details of a series of organised field meetings. It may well be that (as was the case with *The South Yorkshire Plant Atlas*) some participants in the Project may wish to undertake additional personal fieldwork and send records in. I acknowledge this in advance and am very grateful for all such initiatives.

Field Recording Guidelines

A considerable number of plant Red Data Books, rare plant registers and other checklists of rare and scarce plants have been produced already, at both national and regional levels. An important consideration would seem to be to achieve a consistent and adequate level of detail and comprehensiveness in the treatment of each taxon under discussion. This level of detail obviously determines the amount of fieldwork required to provide such information and, hence, the feasible timescale envisaged for the completion of the whole vice-county project.

The Field Recording forms (two to an A4 sheet) may be downloaded from www.ynu.org.uk/plants/links and downloads and will provide for adequate and consistent information on each targeted species. Brief expanded explanatory details are given below of the categories shown on the sheet:

1) Species name - use either the scientific or a recognised English name.
2) Site name and status - the name of a recognised site, e.g. Potteric Carr or Great Horton Country Park and designated status, e.g. Site of Special Scientific Interest (SSSI), Local Nature Reserve (LNR), Local Wildlife Site (LWS) or Country Park (CP). If the location has no recognised name then use any appropriate identification feature, e.g. roadside verge adjacent to minor road from X to Y.
3) Grid Reference - a 10-figure grid reference e.g. SE00000000, preferably using a GPS instrument, but one or two nationally very scarce plants will not be identified to this level

of accuracy (notified as and when they are targeted).

4) Associated Habitat - a brief indication of the associated habitat containing the rare taxon, extending to the immediate vicinity, e.g. deciduous woodland herb layer; marshland; blanket bog; calcareous/neutral/acidic grassland.
5) Associated Species - list a few (up to c.6) of the notable associated plants growing with the rare taxon.
6) DOMIN Frequency - indicate the measure of abundance of the rare taxon. Populations of any plant will vary, often considerably, over time, so attempting to count individual flowering heads or even clumps is often rendered redundant, as the population will likely change in future seasons. Also, the time taken to laboriously count a quite large, if local, population of a rare small sedge (*Carex ericetorum* for example}, is not cost effective. The DOMIN scale, by comparison, is an appropriate method of estimating population numbers by percentage cover, within given tolerance bands. This system is used in NVC (National Vegetation Classification) surveys and is advocated in all surveys where quadrat analysis or other detailed vegetation estimates are required. The DOMIN scale of frequencies is given below :

Plant (Species) Cover of	91 – 100%	Domin 10
	76 – 90%	Domin 9
	51 – 75%	Domin 8
	34 – 50%	Domin 7
	26 – 33%	Domin 6
	11 – 25%	Domin 5
	4 – 10%	Domin 4
	< 4% - i.e., many individuals	Domin 3
	several individuals	Domin 2
	few individuals	Domin 1

7) NVC (National Vegetation Classification) Community – if applicable - It is recognised that not everybody is familiar with NVC terminology but the main NVC types, if applicable, can often be inferred from the associated habitat and species details given above. If in doubt, leave blank.
8) Recorder - the recorder's name.
9) Date of Record - the date the visit was made.
10) UK Threat Category (after Cheffings & Farrell, 2005) - Cheffings & Farrell (2005) list six WCU (World Conservation Union) categories of Nature Conservation concern, i.e. Threat Categories. These are: **Extinct; Extinct in the Wild** (i.e. surviving only in cultivation); **Critically Endangered; Endangered; Vulnerable** and **Near Threatened.** Many plants targeted during the course of the survey will fall into one or other of these Threat Categories.

Field Excursions Programme 2014

I look forward to seeing many of you again on these outings, where we aim to consolidate and take forward the work begun in 2013.

<u>**Sandbeck Park - morning visit**</u> (followed by Roche Abbey and Norwood in the afternoon) - Joint visit by Rotherham Naturalists' Society, South Yorkshire Botany Group and the VC63 Red Data Plant Recording Project. Sandbeck Park is a private estate owned by the Earl and Countess

of Scarborough. Target plants include Mistletoe *Viscum album*, Fritillary *Fritillaria meleagris* and Purple Gromwell *Lithospermum purpureocaeruleum*.
Meet: At the entrance to the Sandbeck Estate at SK566895. Take A634 East from Maltby, the Estate Gate is on the left just before a rt. turn to Firbeck. The walk will start from the stable block on the Sandbeck Estate at **10.00 on Saturday, 26 April 2014. Leader: Derek Bailey.**

Roche Abbey & Norwood – afternoon visit - Joint visit by Rotherham Naturalists' Society and South Yorkshire Botany Group. Target plants include Mountain Currant *Ribes alpinum*, Stone Bramble *Rubus saxatilis*, Wild Daffodil *Narcissus pseudonarcissus*, Greater Chickweed *Stellaria neglecta*, Yellow Star-of-Bethlehem *Gagea lutea*, Mountain Melick *Melica nutans*. Directions from Sandbeck Park will be given on the day. **Leader: Derek Bailey.**

Brockadale YWT Reserve - VC63 Red Data Plant Recording Project. Brockadale is situated on the River Went between Wentbridge and Kirk Smeaton just east of the A1, and is one of the most diverse and species-rich sites in VC 63, situated on the Magnesian Limestone bedrock, and comprising much calcareous grassland and woodland. Eighteen Red Data plants have been recorded over the last 20-30 years, and target species include Purple Milk-vetch *Astragalus danicus*, Dropwort *Filipendula vulgaris*, Pale St. John's-wort *Hypericum montanum*, Rare Spring-sedge *Carex ericetorum*, Hound's-tongue *Cynoglossum officinale*, Spring Cinquefoil *Potentilla tabernaemontani*, Small Teasel *Dipsacus pilosus*, Stinking and Green Hellebore *Helleborus foetidus, H. viridis* and Mezereon *Daphne mezereum*.

Leave the A1 at Darrington (one junction south of the M62). Turn east out of Darrington towards Womersley and after about a mile take the first turning to the right, signed Little Smeaton. After about 1.5 miles take the only right turn into an unsigned tarmacked lane to the Brockadale YWT Reserve car park (SE513173). If you reach the Little Smeaton sign, you have missed the turning by about 200 yds. **Meet at 10.00 on Saturday, 24 May 2014. Leaders: Joyce and Paul Simmons.**

Lindrick Common and Dale - VC63 Red Data Plant Recording Project. This diverse botanical area on the Magnesian Limestone has a total plant list (recorded in *The South Yorkshire Plant Atlas*) of well over 400 species. Target plants for the RDP Survey include Small Teasel *Dipsacus pilosus*, Dwarf Thistle *Cirsium acaule*, Basil Thyme *Clinopodium acinos*, Pale St. John's-wort *Hypericum montanum*, Small Scabious *Scabiosa columbaria* and Field Garlic *Allium oleraceum*. There may also be a chance to see the Marbled White butterfly *Melanargia galathea*, a predominantly southern UK species which is reaching the northern edge of its range in South Yorkshire and Lincolnshire. This species should be flying then, given warm conditions.

For those travelling south, leave the M1 motorway at Junct. 31 and take the A57 eastbound towards Worksop. Continue along A57 for approx. 5.5km and meet in the layby on the N. side of the A57 adjacent to Anston Stones Wood (SK537828). **Meet at 10.30 on Sunday, 6 July 2014. Leader: Kenneth Balkow.**

Wilthorpe Marsh – Joint visit by South Yorkshire Botany Group and the VC63 Red Data Plant Recording Project. Wilthorpe Marsh is one of the most diverse wetland areas in Barnsley District. Target plants for the RDP Survey include Frogbit *Hydrocharis morsus-ranae*, Pale Sedge *Carex pallescens* and Wood Club-rush *Scirpus sylvaticus* at nearby Hoyle Mill. Other species to

look out for are Northern Marsh Orchid *Dactylorhiza purpurella*, Brown Sedge *Carex disticha*, Blunt-flowered Rush *Juncus subnodulosus*, Adder's-tongue Fern *Ophioglossum vulgatum*, Pepper Saxifrage *Silaum silaus* and Bee Orchid *Ophrys apifera*.

Meet at SE324078 (33 Wilthorpe Rd, Barnsley - Sat. Nav. S75 1JA). If coming from the south, take the A635 out of Barnsley for approx 2.5km; if coming from the north, exit M1 motorway at Junct. 38, take A637 towards Barnsley and at first roundabout take A635 (Wilthorpe Rd). **Meet at 10.00 on Saturday, 26 July 2014. Leader: Peter Middleton.**

Fishlake area – Joint VC 63 Red Data Plant Recording Project and South Yorkshire Botany Group visit. This is a diverse area of north-east Doncaster District comprising tidal washlands and other wetland areas around the River Don. Target plants include True Fox-sedge *Carex vulpina*, Narrow-leaved Water-plantain *Alisma lanceolatum*, Marsh Dock *Rumex palustris*, Golden Dock *R. maritimus*, Greater Duckweed *Spirodela polyrhiza*, Fine-leaved Water-dropwort *Oenanthe aquatica* and Stone Parsley *Sison amomum*. Other interesting species include Water Violet *Hottonia palustris*, Greater Burdock *Arctium lappa* and Flowering Rush *Butomus umbellatus*. Coming from the north, leave the M62 at the M18 junction (35) and travel south to Junct 6 on the M18.

Leave at Junct 6, and take the northbound exit along the A614 towards Rawcliffe. After approx. 0.6km turn sharp left off the A614, over the River Don to the car parking area w. of Jubilee Bridge (SE674148). Car parking space is limited, so car sharing would be advantageous. **Meet at 10.00 on Saturday, 9 August 2014. Leader: Louise Hill.**

Blaxton Common – VC 63 Red Data Plant Recording Project. Blaxton Common is a diverse area of abandoned sand workings, open water subsidence areas and scattered to locally dense developing scrub woodland with patchy open grassland communities. Target plants include Long-stalked Crane's-bill *Geranium columbinum*, Heath Cudweed *Gnaphalium sylvaticum*, Needle Spike-rush *Eleocharis acicularis*, Golden Dock *Rumex maritimus*, Hybrid Bulrush *Typha x glauca*, Huntingdon Elm *Ulmus x vegeta* and Slender Parsley-piert *Aphanes australis*.

Coming from the north, leave the M62 at the M18 junction (35) and travel south on the M18, leaving it at Junct 5 (M180). Travel along the M180 to Junct 1, turn right at the roundabout there and join the A18 towards Hatfield and Hatfield Woodhouse. After 1.5km turn left on to the A614 and continue south past Lindholme Prison and pass over the River Torne towards Blaxton Park on the left, at the entrance gates to Levels Lane Plantation and Blaxton Common at SE677016. **Meet at 10.00 on Saturday, 6 September 2014. Leaders: Louise Hill and Geoffrey Wilmore.**

References

Cheffings, C.M. & Farrell, L. (2005) *The Vascular Plant Red Data List for Great Britain. Species Status* 7, 1-116. JNCC, Peterborough.

Wilmore, G.T.D. (2013) A provisional Vascular Plant Red Data List for VC63 – an evaluation of current status. *The Naturalist* 1082, 18-31.

Wilmore, G.T.D., Lunn, J. & Rodwell, J.S. (2011) *The South Yorkshire Plant Atlas*. YNU & YHEDT.

The lichens of Lawnswood Cemetery, north Leeds

Mark R. D. Seaward
Department of Archaeological. Geographical & Environmental Sciences,
University of Bradford, Bradford BD7 1DP

Due to ever-increasing overcrowding in urban churchyards and public awareness of the subsequent health hazards, the cemetery movement came into being and the first one was opened in Norwich in 1819 as a private enterprise. The first in Leeds was opened at Woodhouse (Leeds General Cemetery) in 1835 and the second in Beckett Street (Burmantofts Cemetery) in 1845. Since St Michael's churchyard in Headingley was reaching capacity in the 1870s, a suitable site for a new cemetery was found at Lawnswood. George Corson (1829-1910), a noted Leeds architect, was responsible for the design of the lodge and chapels and the layout of the cemetery, which included retaining a border of trees at its margin and the finest tree specimens within its boundaries. The landscaping was undertaken by William Gay (1814-1893), who had previously been responsible for similar work at Undercliffe Cemetery in Bradford.

Lawnswood Cemetery was opened in 1875 and the first burial took place on 23 January 1876. The original 10 acre cemetery has been extended over the years, the sweeping curves of the Victorian section contrasting with the land-efficient rectangular layout of the 1910 extension. The current cemetery extends to over 65 acres of park and woodland, part of which is listed as of special interest on the Historic Parks and Gardens Register. Within the cemetery, managed by Leeds City Council since 1972, most of the buildings and four of the monuments are Grade II listed. Apart from family plots and the Green Burial Area, the cemetery is currently full for burials.

Although Lawnswood Cemetery (SE2639 & SE2638; alt. 140-155m) is distinctly suburban, being mainly situated in an area of reasonably dense housing and adjacent to a major highway (A660), the lichen flora is relatively rich when compared with that of its environs. This is due in part to the wide range of habitats and substrata available in the cemetery with a variety of imported calcareous and siliceous gravestones as well as many different trees and shrubs of varying ages. However, it should be noted that the younger trees often support a richer epiphytic lichen flora since the older trees have an artificially-induced acidic bark generated by air pollution in the 19th and 20th centuries which is not favourable for most lichens; although this has dramatically reduced in recent decades, the low pH of the bark on trees that would naturally have a higher pH has persisted. The influence of nutrient enrichment (mainly nitrogen compounds) on corticolous (bark), lignicolous (timber) and saxicolous (stone) substrata brought about by the locally derived, and indeed long distance, dispersal of agrochemicals is also evident. A further factor which encourages and maintains the relatively high diversity of lichens at Lawnswood is the sacred nature of the location, the retention of its integrity being paramount in the conservation of these and other biota. Much of this is due to the vigilance of those who are responsible for its upkeep

and to The Friends of Lawnswood Cemetery, established in October 2011 with the aims of promoting, protecting and preserving the cemetery for future generations.

A preliminary checklist of 86 lichen species recorded in 2012 and 2013 is provided below, together with basic information on their preferred substrata and distribution within the cemetery (*N* = northern part SE2639; *S* = southern part SE2638). As well as providing an oasis for more diverse, interesting and luxuriant lichen assemblages, particularly on wood, than those in the local neighbourhood, it should be noted that *Punctelia borreri*, present on a branch of one of its trees, is new to Yorkshire! Other treasures may well be discovered within its boundaries.

Memorials, walls & buildings:

(a) Siliceous

Acarospora fuscata N,S
Baeomyces rufus N
Buellia aethalea N,S
Candelariella vitellina N,S
Lecanora conizaeoides N,S
L. polytropa N
L. soralifera N
Lecidea grisella S
Lecidella carpathica S
L. scabra N,S
Lepraria incana s.lat. *N,S*
Melanelixia fuliginosa S
Porpidia crustulata N,S
P. soredizodes N,S
P. tuberculosa N,S
Psilolechia lucida S
Rhizocarpon distinctum S
R. reductum S
Trapelia coarctata N,S
T. glebulosa S
T. placodioides N,S

(b) Calcareous

Aspicilia calcarea N,S
A. contorta N,S
Caloplaca citrina s.str. *N,S*
C. crenulatella N,S
C. flavescens N,S
C. flavocitrina N,S
C. holocarpa s.str. *N,S*
C. oasis N
Candelariella aurella N,S
Cladonia fimbriata N
Collema auriforme N.S
C. crispum N,S
Lecanora albescens N,S
L. crenulata N,S
L. dispersa N,S
L. muralis N,S
L. semipallida S
Lecidella stigmatea N,S
Physcia adscendens N,S
Placynthium nigrum S
Protoblastenia rupestris N,S
Rinodina oleae S
Verrucaria baldensis N,
V. hochstetteri N,S
V. macrostoma f. *macrostoma S*
V. macrostoma f. *furfuracea N,S*
V. muralis N,S
V. nigrescens N,S
V. viridula N,S
Xanthoria parietina S

Compacted soil

Collema tenax var. *ceranoides S*

Wooden seats (lignum)

Evernia prunastri S
Flavoparmelia caperata S
Hypogymnia physodes S
H. tubulosa S
Lecanora conizaeoides N
L. polytropa N
Melanelixia subaurifera S
Parmelia saxatilis S
P. sulcata N,S
Parmotrema perlatum S
Physcia caesia S
Placynthiella icmalea S
Punctelia subrudecta s.str. *S*
Ramalina farinacea S
Trapeliopsis flexuosa S
T. granulosa S
Usnea subfloridana S
Xanthoria parietina S

Trees (mainly maple, ash, oak and willow) & shrubs

Amandinea punctata N,S	*Lecidella elaeochroma* S	*P. tenella* N,S
Arthonia radiata N,S	*Lepraria incana* s.lat. N,S	*Punctelia borreri* S
Buellia griseovirens S	*L. vouauxii* S	*P. jeckeri* S
Candelariella reflexa N,S	*Melanelixia glabratula* S	*P. subrudecta* s.str. S
Cladonia fimbriata S	*M. subaurifera* N,S	*Ramalina farinacea* N,S
Cliostomum griffithii S	*Mycoblastus fucatus* S	*Scoliciosporum chlorococcum* S
Evernia prunastri N	*Parmelia sulcata* N,S	*Xanthoria candelaria* s.lat. S
Hypogymnia tubulosa N	*Parmotrema perlatum* N	*X. parietina* N,S
Lecanora chlarotera N,S	*Phaeophyscia orbicularis* N,S	*X. polycarpa* N,S
L. expallens N,S	*Physcia adscendens* N,S	
L. umbrina S	*P. caesia* S	

Acknowledgements

The author is grateful to Dr Volker John who assisted him in the field on one of several visits and to the dedication and helpfulness of the Friends of Lawnswood Cemetery, more particularly Ann Lightman.

Book Review

Looking for the Goshawk by Conor Mark Jameson. Pp. 368. Bloomsbury. 2013. ISBN 978-1-4081-6487-7. £18.99, hardback.

Written by the author of *Silent Spring Revisited,* this book gives a fascinating insight into his search for the elusive Goshawk and the place that this impressive raptor has won in people's hearts and imaginations for many decades. The book is written as a diary and is not a scientific monologue but it contains much scientific information and the evocative narrative takes the reader on a journey through Europe and the Americas. During these travels, the author's encounters with like-minded enthusiasts for this magnificent raptor make for stimulating reading.

The book concludes with an eight page appendix entitled *Historic records of Goshawk in the British Isles.* Man's hand has long been against any bird with a hooked beak and the narrative, bringing past records together as it does, illustrates this in gruesome detail. The account for Yorkshire alone, which mainly relates to birds shot or trapped, covers more than a page of small print.

Although the book is not a comprehensive and up-to-date review of the species it is a welcome addition to the genre of popular science and will satisfy anyone looking for a thought-provoking and captivating account of this much maligned bird of prey.

MLD

Recording in VC65 July 2013

John Newbould[1], **Adrian Norris**[2] and **Bill Ely**[3]
[1]email: johna72newbould@yahoo.co.uk
[2]email: adrianxnorris@aol.com
[3]email: billely@hotmail.com

John Newbould (JAN) and Adrian Norris (AN) organised a week-long residential survey based at Low Fremington ($54^0 23'$N $1^0 55'$W). On 30 June Linda Robinson (LR), the BSBI VC65 Recorder, and two friends joined JAN to concentrate on searching wet pastures which are the sites of old records of Small White Orchid *Pseudorchis albida*. On 1 July, with Terry Crawford (TJC) and Bill Ely (WAE), we surveyed a number of areas in the lower Swale valley east of Richmond on both sides of the A1. On 2 June Terry Whitaker (TMW) joined TJC and JAN when we surveyed near Marske, whilst on 3 June TJC, JAN, TMW, WAE and AN visited Thwaite. On 4 July David and Joyce Evans, together with David Lindley (DL), TJC, AN and JAN surveyed Hudswell Wood near Richmond whilst on the final day we left Swaledale for a day in Wensleydale and Garsdale and the headwaters of the River Ure and the Clough River to allow WAE to improve the ichneumon records there.

To give some indication of coverage, plant gall lists were produced for 36 1km squares whilst botanical lists were produced for 15 1km squares in Swaledale and 5 in Wensleydale. There were several other places where short stops were made at roadside verges to record birds, molluscs and galls. A Heath moth trap was run on five nights at Low Fremington and butterfly records were made in 12 1km squares.

The wet weather of 2012 had taken its toll on the area with substantial subsidence on the B6270 from Grinton to Richmond, a landslip at Low Row and the meadows west of Grinton Bridge flooded early in 2013. These wet conditions, coupled with a prolonged cold spell in the spring of 2013, meant that many of the hay meadows had not been cut by the end of June, enabling sample botanical recording along the valley.

Designations: Most of the places surveyed west of Richmond are located within the Yorkshire Dales National Park and included samples from the following SSSIs: Arkengarthdale, Gunnerside and Reeth Moors, Lower Swale woodlands, Fotheringholme, Len Pastures, Crackpot, Millholme Meadows, Stainton Moor and Thwaite Stones.

Mammals: Undoubtedly, our favourite record was at the junction of the River Ure with the Cotterbeck where, for the first time since we started these surveys in 2009, water levels in the rivers were low, enabling DL to search under Holme Head Bridge where he noted Otter *Lutra lutra* spraints and Water Vole *Arvicola amphibius*. We certainly under-recorded the Rabbit *Oryctolagus cuniculus* population as there were numerous road casualty victims between Thwaite and Reeth, probably due to them suffering from myxomatosis. We only noted one Hedgehog *Erinaceus europaeus* squashed on the road just east of Muker. We did

not note any bats at dusk in the Grinton-Fremington area, in contrast with our 2011-12 visits. The National Trust organised a bat survey at Hudswell Wood in August 2013 and found Noctule *Nyctalus noctula*, Daubenton's *Myotis daubentonii,* Soprano Pipistrelle *Pipistrellus pygmaeus* and Pipistrelle *P. pipistrellus*, in line with our 2012 Fremington survey.

Other vertebrates seen included Brown Trout *Salmo trutta fario* in Arkle Beck at Fremington and a Viviparous Lizard *Zootoca vivipara* on Askrigg Common.

Birds: Most of the bird records were casually collected whilst on other recording activity but we submitted a list of 86 sightings to the County Recorder, of which twelve were recorded from Grinton Bridge where we noted Dipper *Cinclus cinclus* (with young), Spotted Flycatcher *Musicapa striola* feeding as well as Common Sandpiper *Actitis hypoleucos*, Oystercatcher *Haematopus ostralegus* in small numbers and a pair of Grey Wagtail *Motacilla cinerea*. Spotted Flycatcher was also seen at the Moorcock Inn in Wensleydale and also along the River Swale at Hudswell Wood. The call of Curlew *Numenius arquata* was frequently noted in moorland areas and Snipe *Gallinago gallinago* was flying low over wet areas of moorland on Askrigg Common and north-west of the Moorcock Inn. House Sparrow *Passer domesticus* was present in many villages with confirmed breeding at Thwaite and around 20 birds in hedges adjacent to housing at Scorton. AN reported a pair of Redstart *Phoenicurus phoenicurus* near Low Whitta and Lapwings *Vanellus vanellus* were back in the valley in very small numbers with a pair calling just east of Low Fremington.

Mollusca: recorded by TJC, DL and AN. See the separate report on page 61.

Invertebrates: TJC, JAN and TMW recorded just seven species of butterfly from 12 1km squares. Small Heath *Coenonympha pamphilius* in Arkengarth Dale, Clapgate Gill and Moorcock Inn was the only red data one. Green-veined White *Pieris napi* was the most frequently recorded whilst others were both Large *P. brassicae* and Small Whites *P. rapae*, Speckled Wood *Pararge aegeria*, Small Skipper *Thymelicus sylvestris* and Ringlet *Aphantopus hyperantus*. Nettle Tap *Anthophila fabriciana* was everywhere. The other most frequently recorded day-flying moth was Chimney Sweeper *Odezia atrata* at seven locations, usually associated with Pignut *Conopodium majus* in the pastures. Pignut was seen in the same area in four of these locations. Co-incidence mapping of these two species at 1km square level by BRC Wallingford shows a mis-match between moth recording and plant recording (see Plate III, centre pages). Silver-Ground Carpet *Xanthorhoe montana* appeared frequently near Stinging Nettle *Urtica dioica* beds.

Moth trapping with a Heath trap was undertaken at Low Fremingon on five nights with two traps on one of the nights. The star attraction was a female Ghost Moth *Hepialus humuli* on 3 July when we ran two traps in a garden bordering a meadow which was cut on 5th July. We also had Confused *Apamea furva* on the same evening. Most of the other moths are common through the county but add to an under-recorded square.

JAN recorded a single Common Green Grasshopper *Omocestus viridulus* at Fotheringholme SSSI on 30 June.

On July 1 at Jetties Riverside Common at Brompton Bridge WAE collected three ichneumons new to VC65: the pimpline *Tromatobia lineatoria*, which attacks spiders, the campoplegine *Dusona stragifex* (the second Yorkshire record) and the ichneumonine *Probolus culpatorius,* which are both parasites of lepidoptera caterpillars. A little further west on the north bank of the River Swale E of Skeeby Beck was the wood-boring beetle *Hedobia (Ptinomorphus) imperialis.*

We then crossed over the A1 and looked at the verges of a minor road at Pepper Arden. WAE recorded the Twin-spot Centurion *Sargus bipunctatus,* two ichneumons new to VC65 – the banchine *Lissonota lineolaris,* which attacks lepidoptera caterpillars, and the orthopelmine *Orthopelma brevicorne* (the second Yorkshire record), which parasitises the gall wasp which forms the Robin's Pincushion Gall – and the first VC65 record of the figitid wasp *Melanips opacus*, which parastises Diptera larvae.

On July 3 we visited Thwaite where WAE worked the southwest verge of Cloggerby Rigg between Cliff Gate Road & Thwaite Bridge and found the Orchid Beetle *Dascillus cervinus* and the Brooklime Leaf Beetle *Prasocuris junci* as well as four ichneumons new to VC65: the pimpline *Acrodactyla quadrisculpta,* a spider parastoid, the tryphonine *Ctenochira propinqua* (eighth Yorkshire record), which attacks sawfly larvae, and two campoplegines - *Diadegma fabricianae* (seventh Yorkshire record), which is a parasitoid of Nettle Tap Moth, and *Diadegma hygrobium* (also the seventh Yorkshire record). In addition, the cryptine *Charitopes carri* was the seventh Yorkshire record.

The footpath south of Cloggerby Rigg had the silken fungus beetle *Antherophagus pallens,* the pimpline *Pimpla wilchristi* (fifth Yorkshire record, all in VC65), the cryptine *Aclastus pilosus* (sixth Yorkshire record) and *Diadegma hygrobium* again.

On July 5 in Wensleydale the orthocentrine *Picrostigeus obscurus* at the roadside verge near the Moorcock Inn (third Yorkshire record) was new to VC65, as was the banchine *Glypta similis* (ninth Yorkshire record) at Garsdale Station. The pimpline *Pimpla melanacrias* (ninth Yorkshire record) was found in Sleddale together with two that were new to VC65 – the campoplegine *Bathyplectes curculionis* (sixth Yorkshire record), a parasitoid of weevils, and the metopiine *Chorinaeus cristator* (third Yorkshire record), a lepidoptera parasite.

Plant Galls: Our visit to Swaledale generated 241 plant gall records from 36 1km squares in the valley ranging from Thwaite Stones in the west to Pepper Arden and Scorton, east of the A1. Once again, Hawthorn *Crataegus monogyna* provided the most records with 39 or 16% of the total. These included a single record of the scarce aphid gall *Rhopalosiphum insertum* and three records of the gall midge *Dasineura crataegi.*

Plate I. Pollarded trees on parish boundaries, some surviving from medieval times, at Filcombe Farm, Dorset (see **p4**). *J.Newbould*

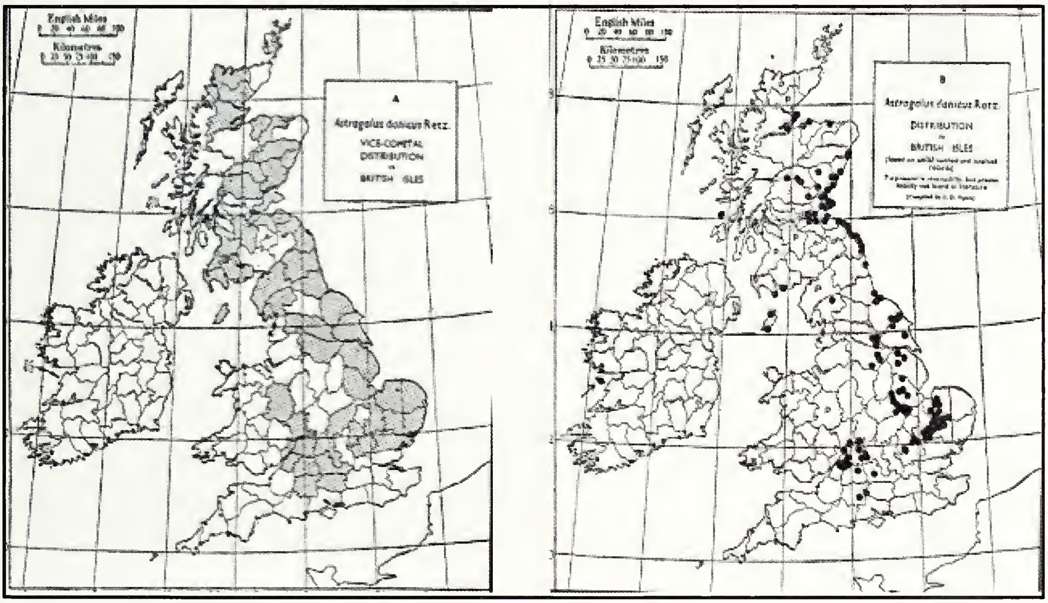
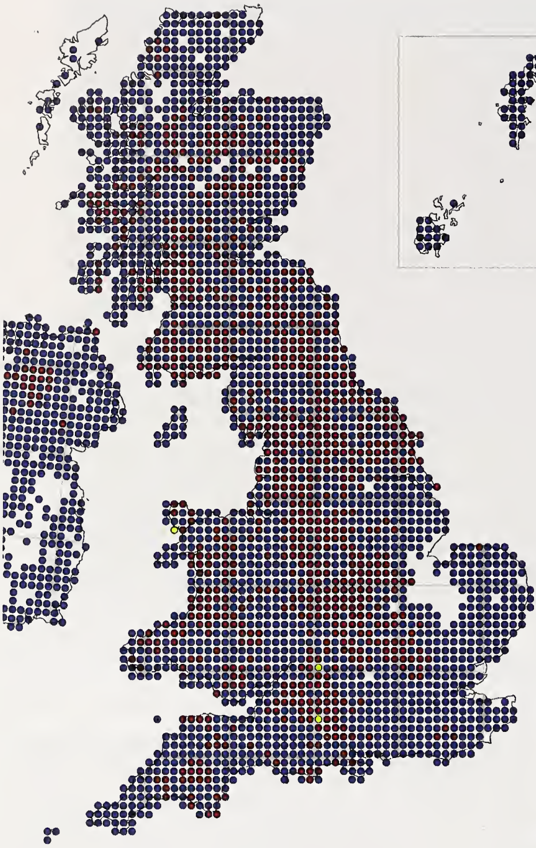


Plate II. Walters' maps of the distribution of Purple Milk-vetch *Astragalus danicus*. These are early examples of the use of Watsonian vice-counties to record distribution (see **p7 and the front cover**). ***Reprinted from:*** **The study of the distribution of British Plants.** ***Botanical Society of the British Isles, Oxford.***



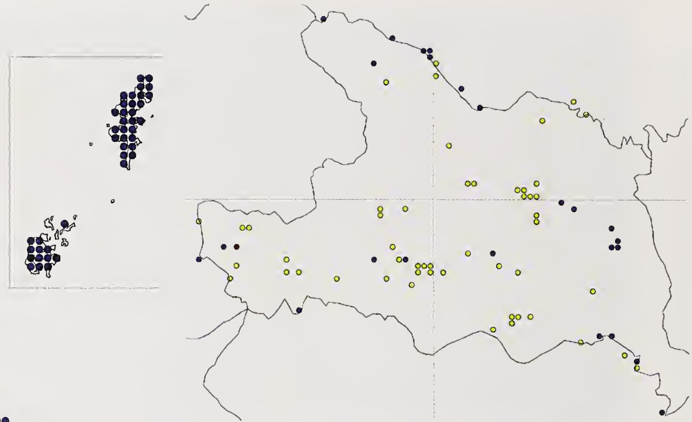


Plate III. Differences in mapping at different scales (see p12 and p39).
Left: Mapped at a 10km square level, blue dots show distribution of Pignut, red dots show distribution of both Chimney Sweeper moth and Pignut while two yellow dots show the moth only.
Above: In VC65, mapped at a 1km square level. Yellow dots show Chimney Sweeper, blue dots Pignut and the one red dot (near left side of map) is where both have been recorded.
The situation in VC65 from data held by the Biological Records Centre at Wallingford October 2013.

Plate IV. Co-incidence mapping (see p12). The map of Winfrith Heath, Dorset (left) shows the distribution of Marsh Gentian (above) by green dots and Petty Whin (right) by red dots.
Map by courtesy of Dorset Environmental Records Centre. Photos: *J. Newbould*

Plate V. Juniper (see pp46-56).
Top left: Juniper growing in Upper Teesdale, on Dinehome Scar near Cronkley Farm. The plants were healthy when photographed in May 2010, but *Phytophthora austrocedrae* was reported on plants in this area in 2013. (The bushes in the foreground are in VC65, those north of the river are in VC66.)
Top right: Healthy Juniper by Browna Gill, Stainton Moor SSSI.
Above left: Healthy Juniper with fruit; Thwaite Stones SSSI, 2013.
Above right: Moribund Juniper; Ingleborough, Juniper Ghyll, Nov. 2013.

T. Whitaker & P. Simmons

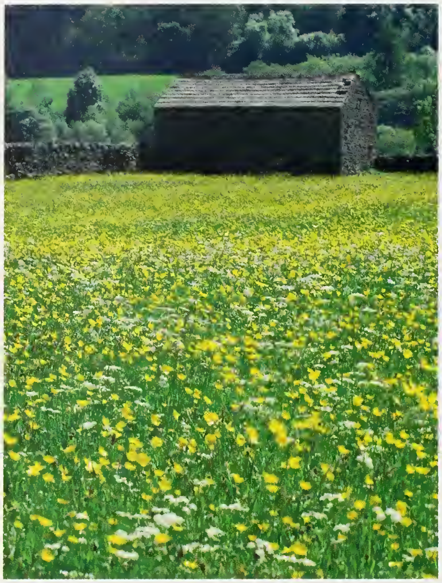



Plate VI. Species-poor (left) and more species-rich (right) meadows in Swaledale (see p43). Both meadows have buttercups and Pignut, but the more rich meadow can be seen to have Wood Crane's-bill, Red Clover and several species of grass. *J. Newbould & P. Simmons*

Plate VII. Wood Crane's-bill, often seen on roadside verges in the Dales (see pp42 and 43). *J. Newbould*

Plate VIII. Plant galls found near Richmond in Swaledale in 2013 (see pp57-58).
Below left: *Cryptomyzus korschelti*, an aphid gall on Mountain Currant.
Below right: Cottonwool Gall *Andricus quercusramuli* on oak. *T. Higginbottom*


Twenty-nine (12%) of the records were from Ash *Fraxinus excelsior,* the second most frequent host plant with the gall midge *Dasineura acrophila,* well recorded in South Yorkshire but with few North Yorkshire records on the NBN Gateway. The gall mite *Cecidophyes rouhollahi* was seen on Cleavers *Galium aparine* in many places in 2012 but only three times in 2013. Another gall mite was *Trisetacus quadrisetus* on Juniper *Juniperus communis* ssp. *communis*. Inevitably this gall will be scarce as it is only found on the fruits of female plants and was recorded at Thwaites Stones and Stainton Moor SSSI. Also associated with Juniper is the fungus *Gymnosporangium cornutum* (see back cover), which galled Rowan *Sorbus aucuparia* at Thwaite Stones and Grinton Church. The teleutospores are found on Juniper in the spring and the spermogonia and aecidia are on Rowan in the autumn (Wilson and Henderson, 1966). There is no publicly available information on the NBN Gateway. Two scarce fungal galls were *Puccinia chaerophylli* on the fairly common Sweet Cicely *Myrrhis odorata* and the not uncommon rust *Phragmidium sanguisorbae,* which was found on the only patch of Salad Burnet *Sanguisorba minor* seen all week, at Clapgate Gill.

More galls were recorded on oak in 2013 than in previous years with five species and seven records. Even the large oak at the entrance to Grinton churchyard, which has yielded nothing in previous years, had the wasp gall *Andricus curvator,* also seen on a young oak further east at the head of Deepdale. There were three records of the Cherry Gall *Cynips quercusfolii* and one record of the wasp gall *Cynips longiventris.*

There was a single record of the artichoke-shaped midge gall of *Taxomyza taxi* on Yew *Taxus baccata* in Hudswell Wood and also a single record of the mite gall *Eriophyes arianus* on Whitebeam *Sorbus aria* agg. at Marske. Again, little information on this species is available on the NBN Gateway. With little Field Maple *Acer campestre* found in the upper Dale, we needed to be at the eastern end to record its galls. Four common ones were seen at Pepper Arden and Brompton-on-Swale.

Broad habitat types in the survey area included:

Rivers and streams: The importance of the River Swale and its associated tributaries such as Arkle Beck and Gunnerside Gill is in providing habitat for many invertebrates and higher vertebrates, e.g. Otter and Water Vole. For the first time since 2009 our visit had not been preceded by heavy rain so, with water levels low and the stone beds exposed, there were occasional survey opportunities. We did not note any waterside plants of conservation importance. The National Trust is controlling Himalayan Balsam *Impatiens glandulifera* at Hudswell Wood. Monkeyflower *M. guttatus* was recorded on the north bank of the Swale opposite Hudswell Wood and also on the north bank of the River Ure near Thwaite Bridge with the hybrid neophyte *Mimulus guttatus x luteus (M. x robertsii)* near Stang Bridge.

Boundary and linear features: Traditional hedgerows are really only found in the lower valley east of Low Fremington. The field between Home Farm and Grinton Bridge has a

managed five-species hedge containing Ash, Hazel *Corylus avellana,* Dog Rose *Rosa canina* s.l., Wych Elm *Ulmus glabra* and Elder *Sambucus nigra*. East of Richmond the Swale enters the lowlands of the Vale of York, agriculture becomes more intense but four- or five-species hedges can be found with the occasional veteran Ash as at Scorton, where JAN noted a pollard with a diameter of 1.25m (considered truly ancient by DEFRA) in a hedge containing old Hawthorns and Elder. Another typical hedge at Pepper Arden had a number of standard Ash, a single Pedunculate Oak *Quercus robur*, Hawthorn, Dog Rose and Elder.

Most of the field boundaries in the upper Dale are dry stonewalls. These may have considerable biodiversity interest with one wall at Thwaite having the distinctive lichen *Cladonia diversa* and the Common Pincushion Moss *Dicranoweisia cirrata* amongst a number of unidentified crustose lichens. In many other instances the field boundary is a wet woodland containing Alder *Alnus glutinosa*.

Elsewhere, verges seem to be an important refuge for Wood Crane's-bill *Geranium sylvaticum* (see Plate VII, centre pages) with records from Hawdraw and Crackpot.

Upland mixed ashwoods: A narrow stretch of Ash-Rowan-Dog's Mercury community (NVC W9a) is at Gill Plantation, south-east of Crackpot. This steep east-facing woodland slopes down to Haverdale Beck and has most of the plants typical of this woodland community with the exception of Dog's Mercury *Mercurialis perennis*. There are many Hazel coppice stools and Toothwort *Lathraea squamaria* was still visible unusually late in the season. Alder was associated with the beck and wet seepages had Opposite-leaved Golden-saxifrage *Chrysosplenium oppositifolium* and Ramsons *Allium ursinum* replacing Dog's Mercury. Holly *Ilex aquifolium* was also present but Wych Elm was rare. The Haverdale Beck to the north of a small bridge had an interesting moss-covered waterfall. Doreen Davis recorded 18 common bryophytes here including Long-beaked Water Feather-moss *Rhynchostegium riparioides* and the Endive Pellia liverwort *Pellia endiviifolia* and commented that the list would have been doubled by collection with microscopic examination. We also recorded the lichen *Peltigera membranacea* from a fence post on the east side of the wood.

Lowland mixed deciduous woodland: see Hudswell Wood report page 63.

Wet Woodlands: Typically NVC community W7 Alder–Ash–Yellow Pimpernel woodland is found alongside watercourses through the Swale Valley with trees such as Sycamore *Acer pseudoplatanus*, Rowan, Hazel and Downy Birch *Betula pubescens* as components together with either Goat *Salix caprea* or Grey Willow *S. cinerea*. Such communities appeared in the surveys carried out in 2013 at Hudswell Wood, Crackpot, Fotheringholme SSSI and at Thwaite and have been reported on our previous visits. Whilst JAN generally has looked at Alder for its galls, little attention was paid to obtaining detailed botanical data on its associated plant communities nor on assessing any past management such as coppicing or possible age of the woodland by tree size. Grime (2007) reports that seedlings have only been recorded up to 240m but at Thwaite Bridge and Skeugh Gill we recorded it at c.280m

in quite wet areas on waterlogged soils, although Alder prefers freely-draining soils, while at Fotheringholme in Arkengarthdale it was at 300m. Whilst Alder is shown filling most 10km squares in the UK on BSBI and NBN Gateway distribution maps, more detailed recording with altitude might well reveal a different story. Certainly with published data in VC65 (at higher resolution) the tree and the potential distribution of the habitat is data deficient. Seedlings are susceptible to drought and a cold spring and they also require high humidity and high oxygen together with a high light intensity. All are factors which could limit germination.

Acid grassland: No areas of acid grassland surveyed were large enough for the habitat to be mapped. At three places marginal Heather *Calluna vulgaris* indicated more acidic areas but generally these were on the edges of flushes.

Neutral grassland – lowland meadows (see Plate VI, centre pages): In early June, JAN and his wife drove through Swaledale whilst returning from Scotland and stopped in Gunnerside, when he took the opportunity to survey a meadow full of Meadow Buttercup *Ranunculus acris*. He could barely believe that he noted just 12 species of plants. Returning in early July, he looked at just two more of these buttercup meadows with one at Low Whitta scoring just 12 plant species and one between Fremington and Grinton just 18. Many of these meadows, can only reasonably be surveyed by looking over a gate or a wall so as not to damage the silage crop. Peterken (2013 pp 194) considers the factors underlying plant diversity in meadows and two of them stand out:

- Soil texture, reaction and nutrient status (Ellenburg indicator values (Hill *et. al.*, 2004)): the plants in these meadows indicated low nitrogen, neutral pH, good light and reasonable moisture levels. Only the meadow at Low Fremington had Meadow Crane's-bill *Geranium pratense* and Bistort *Persicaria bistorta* but all had Pignut. There was just one meadow at Thwaite with a single plant of Wood Crane's-bill skulking by a wall where the machine could not reach.
- Management past and present determines the plants capable of growing on a site. Elsewhere, at Hudswell Wood, species loss in the National Trust meadow is described on page 67. It is concluded that, with silage crops being taken from late June to mid-July using very new tractors and large-scale equipment, farmers are using contractors whose next jobs will be in the cornfields of the adjacent Vale of York. Is there any evidence that the meadows are being cut too early before viable seed has set?

Fortunately, there are wet pastures on hill slopes unsuitable for machines where good grassland still exists. Many of these are protected within the SSSI network. Some of these are outlined in the paragraph on upland flushes.

Upland meadows: The meadows looked more promising on the hill slopes in the upper Dale. JAN surveyed two north of the hamlet of Thwaite. One, forming part of a SSSI, had 21 species of flowering plants, sedges and rushes including Quaking-grass *Briza media*, Bistort,

Yellow-rattle *Rhinanthus minor*, Bird's-foot-trefoil *Lotus corniculatus*, Pignut, Heath Milkwort *Polygala serpyllifolia,* Mouse-ear-hawkweed *Pilosella officinarum*, Tormentil *Potentilla erecta,* Common Knapweed *Centaurea nigra* and Green-ribbed Sedge *Carex binervis*. Bluebell *Hyacinthoides non-scripta* was found adjacent to the Alder woodland at the streamside.

Another meadow west of Skeugh Gill had an interesting wet area forming a mixture of NVC community MG8 Crested Dog's-tail–Marsh Marigold and the rush pasture community MG9 Yorkshire Fog–Tufted Hair-grass with herbs such as Ragged Robin *Lychnis flos-cuculi*, Marsh Bedstraw *Galium uliginosum* and frequent Sweet Vernal-grass *Anthoxanthum odoratum,* Cuckoo Flower *Cardamine pratensis* and Yellow-rattle.

At Clapgate Gill, north-east of Marske, we headed north across some quite improved grassland where, by chance, was what we can only assume was a former mining spoil-heap. In what at first seemed an unpromising area we recorded nearly sixty species of plants. It was an area of mixed habitat with occasional patches of quite dense Bracken *Pteridium aquilinum*, Hawthorn and Holly scrub, acid grassland with Heath Bedstraw *Galium saxatile,* Mat-grass *Nardus stricta* and Wavy Hair-grass *Deschampsia flexuosa,* wet flushes with Tufted Hair-grass *D. cespitosa,* Marsh Thistle *Cirsium palustre,* Common Yellow Sedge *Carex viridula* ssp. *oedocarpa* and Water Forget-me-not *Myosotis scorpioides*. The spoil heap was covered with Rock-rose *Helianthemum nummularium* which TMW searched in vain for the presence of Northern Brown Argus *Aricia artaxerxes* larvae. Other herbs present here included Limestone Bedstraw *Galium sterneri*, Fairy Flax *Linum catharticum* and Salad Burnet.

Adjacent to Clapgate Beck was a large coppiced Ash which yielded nine common lichens on three small twigs.

<u>Upland flushes, fens and swamps:</u> These are defined as peat or mineral-based terrestrial wetlands in upland situations which receive water and nutrients from surface and/or groundwater sources as well as rainfall. On Sunday June 30th JAN and LR surveyed two places at Len Pasture and Fotheringholme specifically for Small White Orchid. This is a tuberous perennial herb of well-drained hill pastures with an Ellenberg indicator value of pH6 but was found here with associated plants having a much more acidic value. Preston *et.al.* (2002) describes it as a declining plant in a wide range of habitats including those on calcareous soils. LR wanted to search wet areas where the pasture changed from calcareous grassland to acidic grassland, describing the plant as being in that sort of transition zone in the Dales. At Len Pasture it was associated with Devil's-bit Scabious *Succisa pratensis*, Tormentil, Sweet Vernal-grass, Pignut and Wood Anemone *Anemone nemorosa*. At Fotheringholme associates included Green-ribbed Sedge, Star Sedge *Carex echinata,* Flea Sedge *C. pulicaris,* Lousewort *Pedicularis sylvatica*, Tormentil, Mat-grass and Heath Milkwort. At Len Pasture the average Ellenberg value for light was 6.2, for water 5.82, pH 4.73 and nitrogen 3.45 whereas at Fotheringholme light was 7.36, moisture 6.73, pH 3.36

and nitrogen 2 (scores are evaluated with 1 being a low value, 5 being mid-range and 10 being a high value).

With these wet flushes being too steep for agricultural machinery to work and with no summer grazing, these relict pastures are some of the most important biodiversity habitats in the Dales. At Fotheringholme we recorded 75 plant species (on a day of poor weather) together with Small Heath butterflies and Chimney Sweeper moths. Curlew was heard calling from nearby. The southwestern pasture slopes adjacent to Arkle Beck had some of the finest flushes JAN has seen with Globeflower *Trollius europaeus* and two species of fragrant orchid now granted full species status: Marsh Fragrant Orchid *Gymnadenia densiflora* and Heath Fragrant Orchid *G. borealis (*Meekers *et. al.,* 2012). We also saw Frog Orchid *Dactylorhiza viridis* and the only record for Hard-fern *Blechnum spicant* during the week was here.

60 plants were recorded at Len Pasture, including Bitter Vetch *Lathyrus linifolius*, Bird's-foot-trefoil, Bluebell, Mouse-ear-hawkweed, Yellow-rattle, Ragged Robin in the wet flushes and mosses such as Glittering Wood-moss *Hylocomium splendens* and Philibert's Tamarisk-moss *Thuidium assimile.*

Mountain heaths and willow scrub: Juniper *Juniperus communis* ssp. *Communis* - see separate article by Whitaker and Newbould on page 46.

Inland Rock – scree slopes: Apart from Juniper at Thwaite Stones, the only record of any interest was Viper's Bugloss *Echium vulgare* growing from a west-facing scree slope in Deepdale.

Calaminarian grasslands: Rodwell (2000) defines the OV37 community as being restricted to spoil heaps of lead mines or outcrops of veins of heavy metals among calcareous rock-beds around the upland fringes of north and west Britain. Such habitats are usually open to grazing stock but the composition of the vegetation is strongly influenced by the mineralogy of the parent material. In terms of this report, such areas in the Yorkshire Dales can be found down to altitudes of 150m. Typical communities contain Sheep's-fescue *Festuca ovina* and Spring Sandwort *Minuartia verna*. In the four years of this Swaledale survey it is very much an under-recorded habitat.

At a brief stop at Crag End just northwest of the Charles Bathhurst we recorded Moonwort *Lunaria annua, S*pring Sandwort*,* Wild Thyme, Mountain Pansy *Viola lutea* together with Sheep's-fescue, Bird's-foot-trefoil and Sweet Vernal-grass.

References

Anon (1996) *UK Biodiversity Group Tranche 2 Action Plans* III *plants and fungi.* English Nature, Peterborough.

Anon (2007) *Report on Species and Habitats Review.* JNCC, Peterborough viewed on line at http://jncc.defra.gov.uk/PDF/UKBAP_Species-HabitatsReview-2007.pdf

Anon (2011) *UK Priority Habitat Descriptions.* JNCC Peterborough viewed on line at http://jncc.defra.gov.uk/PDF/UKBAP_PriorityHabitatDesc-Rev2011.pdf

Averis, A.., Averis, B., Birks, J., Horsfield, D., Thompson, D. and Yeo, M. (2004) *An Illustrated Guide to British Upland Vegetation.* JNCC, Peterborough.

Bacon, J. Ed. (2003) *The scrub management handbook.* English Nature, Wetherby.

Backsall, J., Manley, J. and Rebane, M. (2001) *The upland management handbook.* English Nature, Wetherby.

Comley, R., Payne, J. and Payne K.G. (1998) YNU Excursions in 1996 Booze in Arkengarthdale. *The Naturalist* 123, 38-39

Dobson, F.S. (2011) *Lichens,* 6th edn. Richmond Publishing Slough.

Grime, P.J., Hodgson, J.G. and Hunt, R. (2007) *Comparative Plant Ecology* revised 2nd edition. Castlepoint Press, Dalbeatie.

Hill, M.O., Preston, C.D. and Roy, D.B. (2004) *Plantatt – Attributes of British and Irish Plants: Status, Size, Life History, Geography and Habitats.* Centre for Ecology and Hydrology, Biological Records Centre, Wallingford.

Meekers, T., Hutchings, M.J., Honnay, O. and Jacquemyn, H. (2012) Biological Flora of the British Isles: *Gymnadenia conopsea* s.l in Ed. Hutchins, M. *Journal of Ecology.*100 1269-1288 British Ecological Society, London.

Peterken, G. (2013) *Meadows.* British Wildlife Publishing, Gillingham Dorset.

Preston, C.D., Pearman, D.A. and Dines, T.D. (2002) *New Atlas of the British and Irish Flora.* Oxford University Press, Oxford.

Rodwell, J.S. (1991), *British Plant Communities* I *Woodlands and Scrub.* Cambridge University Press, Cambridge.

Rodwell J.S. (1993) *British Plant Communities* III *Grassland and montane communities.* Cambridge University Press, Cambridge.

Rodwell J.S. (2000) *British Plant Communities V* Maritime *communities and vegetation of open habitats.* Cambridge University Press, Cambridge.

Wilson, M. and Henderson, D.M. (1966) *British Rust Fungi* Cambridge University Press, Cambridge.

Yorkshire Juniper scrub *Juniperus communis* ssp. *communis* - a re-appraisal in the face of a new threat

Terry Whitaker 4 Crowtrees, Low Bentham, Lancaster LA2 7E
e-mail: t.whitaker1@btinternet.com
and
John Newbould 3 Brookmead Close, Sutton Poyntz, Weymouth DT3 6RS
e-mail: johna72newbould@yahoo.co.uk

Juniper *Juniperus communis communis* is a coniferous shrub native to the British Isles. Although its centre of distribution is within Scotland it occurs at scattered localities in southern England, northern England and Wales, mostly as a component of heath or chalk and limestone grassland communities. It is was originally protected under the Wildlife and

Countryside Act of 1981 and, due to dramatic declines in population and range throughout Europe (Ward, 2007), is highlighted under the European Habitats and Species directives. Juniper scrub is currently listed on Annex I of the EU Habitats Directive (92/43/EEC).

In the South of England the strongholds are the south Wiltshire Downs, south Hampshire (Ward, 2003, 2004) and at one time Surrey, but the decline there has been especially severe (Lena Ward pers. com.). Where Juniper is the dominant woody plant, NVC W19 *Juniperus communis-Oxalis acetosella* woodland (Rodwell, 1991) is a unique and uncommon woodland vegetation type of northern England and Scotland, mostly on SSSIs (Horsefield & Thompson 1994) and is in reality the pseudoclimax of seral progression and usually comprised of an even-aged population of over-mature plants. This northern Juniper 'woodland' is particularly important in terms of nature conservation whilst high altitude stands are valuable indicators of a natural tree line in England. There have been substantial losses in nearly every English vice-county (Backshall *et al.* 2001, Ward 2007, 2010). According to the most recent National Inventory of Woodland & Trees (Anon 2001), the areas of Juniper trees in woodland with a minimum area of 2ha were: England 99ha; Scotland 302ha; Wales 0ha, giving a UK overall total of 401ha.

The 26.5ha in the Lake District and the Yorkshire stands in VC64 represent the most southerly examples of this W19 community. The second largest area of Juniper 'wood' in the UK (and the largest in England) is in Yorkshire VC65 (in the current county of Durham) on part of Upper Teesdale SSSI (Durham) and the adjacent and contiguous Appleby Fells SSSI (Cumbria), Moorhouse and Cross Fell SSSI (Cumbria and Durham) and is protected as part of a Special Area of Conservation (SAC - EEC Directive 79/409/EEC) The included Upper Teesdale NNR has been declared a 'Biosphere Reserve' by UNESCO. In these large contiguous sites on the volcanic 'Whinsill' crags, along the River Tees and on Cronkley and Holwick Fells, Juniper forms substantial stands of W19 scrub. In Yorkshire it occurs on the limestone scars of Kisdon Fell, Harkerside Moor (Swaledale), Moughton Fell (Ingleborough) and a few small sites on the North York Moors.

Common Juniper is recognised as important and vulnerable because its extent and condition have declined considerably over the past 25 years, especially on upland sites where its importance is tied in with nature conservation and game management. Juniper is also a key food plant for a wide range of invertebrates and birds and has a unique and specialised group of associated insects, fungi and lichens. Juniper is dioecious, with male or female plants, unlike most trees where both male and female flowers occur on the same tree. Male flowers appear as yellow blossoms near the ends of the twigs in spring and release pollen which is wind-dispersed. Female flowers are in the form of very small clusters of scales which, after pollination, grow on to become berry-like, irregularly-sided cones 0.6cm in diameter, green at first but ripening slowly after a minimum of 18 months to a dark blue-purple colour and, after up to four years, turning black (Bacon 2003, Ward 2010). The seeds require disturbed ground to germinate and often pass two winters in a dormant state, are slow growing, vulnerable to competition and susceptible to drought. There is a problem

of predation from Rabbits, especially during lying snow, whilst larger animals only graze young plants.

Juniper communities are seral because extensive natural regeneration only tends to take place if the ground is disturbed by severe grazing or quarrying. In southern England it is commonly a part of a seral chalk grassland community, generally growing on shallow rendzinas representing a gradual transition to Beech *Fagus sylvatica* and Yew *Taxus baccata* woodland. Further north it occurs on both acidic and basic soils on rocky hillsides, moorland and maritime heaths, in birch, oak and pine woods and can be part of a succession to birch wood. Scrub and seral communities are not easily treated in the NVC classification and consequently were not given due consideration in early BAPs and HAPs. This nationally scarce woodland type, now mostly on statutory protected sites, merits just a paragraph in Selman *et al.* (1999), which gives no estimate of its extent in Yorkshire. However, the Yorkshire Dales Biological Action Plan [YDNP BAP] (YDNPA, 2000), although treating it with other Dales scrub habitats totalling 33ha (W21 *Crataegus monogyna-Hedera helix* scrub, W22 *Prunus spinosa-Rubus fruticosus* scrub and W24 *Rubus fruticosus-Holcus lanatus* underscrub), devotes a comprehensive, three page individual SAP to it. It is not easy to calculate the extent of Juniper reliably from published sources. In Natural England's documentation of the management units of SSSIs it is often confusingly referred to as "broadleaved, mixed and Yew woodland - upland" (e.g. in the dominant phase 1 habitat designation of Ingleborough SSSI Unit 33). In many publications it is clear the area figures reflect total site areas, not the areas of Juniper biotope, and the reorganisation and redesignation of the areas within the contiguous Upper Teesdale SSSI in 1990 further clouds the broader picture. Hence our estimate of the area of Juniper (not including numerous widely distributed solitary plants and small groups of bushes where it covers less than 0.5ha) is different from those previously estimated. Drawing together published information on the extent of this resource, Watsonian Yorkshire (VCs 64 & 65) appears to support *c.*75 ha of W19 vegetation (Table 1).

Juniper has long been considered under threat mainly because of regeneration failure due to unsuitable conditions. The long life of adult bushes gives rise to moribund populations dominated by male plants which appear to survive longer. No regeneration may be recorded for long periods because severe Rabbit or sheep grazing prevents seedling establishment. In Yorkshire, Cheetham (1934) presented evidence that the Moughton Juniper was the most degenerate in the northwest part of the site [Unit 32] although "30 or 40 years ago that was well covered and healthy". All that remained In 1990 were occasional dead stumps in the northwest corner (Winder, 1990). Plants in the southeast [Units 35 & 36] were considered by Cheetham to be the youngest and most flourishing but Winder noted that they were overmature and degenerate. The Teesdale population was also considered in decline in 1925 (Cheetham, *loc. cit*).

Table 1. Inventory of large Juniper Sites in Watsonian western Yorkshire.

VC	Location	Site name	Approx Grid Ref.	Unit area Ha	Juniper area Ha	No. of plants 100s	Source
	Teesdale, Durham	Included parts of VC66 Moorhouse & Cross Fell SSSI	NY72, NY73, NY82, NY83, NY92	14036	c. 100	150-200*	Clifton *et al*. 1995 *from Gilbert 1990
65	Durham	**Upper Teesdale SSSI**			40.5		Horsefield & Thompson 1994
		Unit 79	NY884284	668	?		Natural England SSSI http://magic.defra.gov.uk/
		Unit 82	NY887281	275	?		Natural England SSSI http://magic.defra.gov.uk/
65	Baldersdale (Teesdale) Cotherstones Moor, Durham	**Hunder Beck Juniper SSSI**	NY931178	3.4	1.5	3.94	Clifton *et al*. 1995
65	Swaledale, Yorkshire	**Thwaite Stones SSSI**		17		5	Natural England SSSI information
		Unit 1	SD893989	12	<4	20	TW; this paper
		Unit 2	SD897987	5	<2		TW; this paper
65	Swaledale, Yorkshire	**Scar Close, Kisdon Side SSSI**	NY883004		<0.5		TW; this paper
65	Swaledale, Yorkshire	**Lovely Seat-Stainton Moor** SSSI Unit 5 Browna Gill	SE011982	20	<20	<15*	TW; this paper * Ward unpubl. data 1972
65	Swaledale	**Feetham Holme SSSI** Unit 1	SD994977	3.15	1	15*	Natural England SSSI information * Ward unpubl. data 1972
64	Ribblesdale	**Ingleborough SSSI**			4.4		Horsefield & Thompson 1994
		Ingleborough SSSI		5230	14.1		TW; this paper
		Juniper Ghyll (Unit 33)	SD793713	11	1.4		TW; this paper
		Lower Juniper Ghyll (Units 35 + 34)	SD798713 SD798710	15+2	0.5		TW; this paper
		Horton Quarry Edge (Unit 36)	SD796715	8	<.1		TW; this paper
		Moughton (Unit 82)	SD78 72	296	<12		TW; this paper

Evidence that seedling viability of Juniper declines with age of parent means that the potential for natural regeneration will also decline if stands are allowed to become moribund (Raatikainen & Tanska, 1993). Aged plants collapse and sometimes reproduce by self layering but, unfortunately, this gives rise to clones, genetically identical to the parent. These ageing populations may have been caused by excessive grazing, the prevention of seedling establishment or, in the south of England, insufficient grazing reducing the area for regeneration with seral progression shading out the plants (Ward, 1977; Clifton *et. al.*, 1995; Anon, 1996). All the known Dorset plants are males, often fewer than 10 at a site. Lena Ward (*pers. comm.*) gives her assessment of the main reasons for the historical decline. *"I have often suspected old age, as Juniper does seem to have a life span that is around 130 years in the open, in chalk grassland, but a lot longer in the north. I recorded what I think is the oldest Juniper in Teesdale (Durham) in 1987 with 255 annual rings. I think an opportunity has been missed in the study of Juniper ages in Teesdale as no one seems to have looked at the ages and past annual ring growth of the Junipers that died or had to be destroyed."*

Meanwhile, little effective conservation has taken place and now a new threat has emerged. Dieback and browning had been noted at all the major Yorkshire sites and were ascribed to damage in severe winter weather in previous years but we now realise that those symptoms most likely reflected infection by *Phytophthora austrocedrae*, an oomycete, a fungus-like organism that infects the plant through the root system and causes the foliage to decline and eventually die. It is a new and acute threat to British Juniper and related conifers. Reports were received in late 2010 of serious decline of native Juniper at the Upper Teesdale NNR affecting more than 200ha of Juniper. Dead and dying trees were scattered throughout c.14ha near High Force, mainly concentrated on wet, flat ground but also extending outwards across drier slopes. Affected trees had foliage reddening and browning over all or most of the crown. Examination of trees showing these symptoms revealed orange-brown lesions in the phloem at the stem collar and upper roots and scattered dieback of shoots or individual branches. Three trees had discrete girdling orange-brown phloem lesions with no apparent connection to the base of the tree (Green *et al.*, 2012). How the pathogen was introduced is still uncertain but it could have been with imported garden *Cupressaceae* as some of the early cases were on other hosts such as Lawson's Cypress *Chamaecyparis lawsoniana* and Nootka Cypress *Chamaecyparis nootkatensis*. Aged populations may be especially badly affected.

The extent of outbreaks in the UK by December 2013 is given in Table 2. Information about confirmed infections in the same period in Yorkshire sites (VC64 & VC65) is given in Table 3. Judging by advice given by Webber *et al.* (2012) the prognosis is poor for saving extensive areas of Juniper already infected. Once again the statutory UK plant health authorities appear to have failed in their responsibilities.

Table 2. Reported *Phytophthora austrocedrae* outbreaks in the UK.
(December 2013 - Sources: S. Green (2013) unpubl., A. Kirkwood (FERA) pers. comm. and http://www.forestry.gov.uk)

Location	Natural Environment	Nursery	Garden	Total sites
ENGLAND				**26**
Cornwall			2	2
Cumbria	14	1		15
Devon	-	1	1	2
Durham	2	2		4
Yorkshire	3			3
SCOTLAND				**7**
Perthshire	1			1
Highland	4			4
W. Scotland			2	2
TOTAL				**33**

Table 3. Juniper dieback & *P. austrocedrae* on sites in western Yorkshire.

Site Name	Approx Grid Ref.	SSSI site condition assessment (Natural England online information)	Introduced Plantings?	Notes from Site visits in 2013	***Phytophthora austrocedrae* confirmed** (see below)
Teesdale NNR					2011
Upper Teesdale SSSI					
Dineholm Scar (Above High Force)	NY869281				2013
Below High Force (Unit 79)	NY884284				
Above Low Force (Unit 82)	NY887281				
Holwick (Low Force)	NY892278				2013
Hunder Back Juniper SSSI	NY931178	Dieback noted in May 2010	Planting pre 2010		
Thwaite Stones SSSI Units 1 & 2	SD893989	Dieback & browning noted in Unit 1 in April 2009	Adjacent tree planting	Minor dieback & browning noted in Unit 1 in June 2013	
Scar Close, Kisdon Side SSSI	NY883004				
Lovely Seat-Stainton Moor SSSI					
Harkerside Moor Browna Gill (Unit 5)	SE011982				2013 SE012981

Bellerby Moor, Black Beck	SE089936				2013 (FERA)
Feetham Holme	SD994977	Complete lack of regeneration May 2013	None		
Ingleborough SSSI (Unit 1)	SD77				
South House Moor (Unit 80)	SD7676	Rewilding of House Moor (Corkhill 1998)	100 Juniper planted (with 7000 other trees) 1998-9		
Juniper Gill (Unit 33)	SD793713	In 2009 a number of dead plants noted "is small in relation to number of healthy plants." YDNPA monitoring & collecting seed.	Minor Planting of local stock (in 2002)	Very severe dieback & browning noted in November 2013	2013 (SD790714)
Lower Juniper Ghyll (Units 35 + 34)	SD798713 SD798710		Planting 80 *p.a.* 2011-13 (Graham & Cannon 2011)	Extensive dieback & browning noted in Nov 2013	
Horton Quarry Edge (Unit 36)	SD796715				
Moughton (Unit 82)	SD7872		No planting	Very severe dieback & browning noted in Nov 2013	2013 (FERA)

Sources of confirmation: Green *et al.* (2013, in Prep.), A. Kirkwood (FERA) pers. comm.

In 2009 we visited a small area of Juniper on a west-facing slope at Scar Close, Kisdon Side SSSI at 360m (SD893004) with Adrian Norris and David Lindley. The Juniper here fits neatly into the NVC W19a *Vaccinium vitis-idaea - Deschampsia flexuosa* sub-community (Rodwell, 1991, Averis *et. al.*, 2004). In 1996 with Richard Comley we found two bushes on a trackside bank in Arkengarthdale at Low Faggergill (NY9705) (Comley *et. al.,* 1998). The published records *via* www.bsbi.org.uk/maps show few post-1986 records in the north of England while Abbott (2005) only shows it in 10 tetrads of VC64. We have observed both male and female plants at the three sites in the Dales seen since 2009. At Kisdon the Juniper was in grassland (locally NVC CG9) with limestone scree running through it and herbs included Tormentil *Potentilla erecta*, Rock-rose *Helianthemum nummularium*, Bird's-foot-trefoil *Lotus corniculatus*, Primrose *Primula vulgaris*, Heather *Calluna vulgaris*, Quaking Grass *Briza media*, Mouse-eared Hawkweed *Hieracium pilosella,* Blue Moor-grass *Sesleria caerulea* and Mat-grass *Nardus stricta*.

During summer 2013 we visited the Lovely Seat-Stainton Moor SSSI near Low Whitta with Juniper extending over an area of at least 1 sq. km at the northern edge of Unit 5 on a gentle north-facing slope to c.300m and also the Thwaite Stones SSSI, which is a smaller area on a steep southwest-facing slope from the valley bottom up to 480m. On the first site all the Juniper was located east of Browna Gill. Bracken *Pteridium aquilinum* had been treated and there was no regrowth with last year's crop all brown. The grassland was mainly acidic with Wavy Hair-grass *Deschampsia flexuosa*, Sheep's Sorrel *Rumex acetosella*, Heath Bedstraw *Galium saxatile*, Wood Sorrel *Oxalis acetosella*, Thyme *Thymus polytrichus*, Tormentil and scattered Bilberry *Vaccinium myrtillus,* all fitting again into the NVC W19a sub-community.

At Thwaite Stones SSSI the ground flora was mainly Bilberry with nearby Heather, Deer-grass *Trichophorum germanicum*, Heath Bedstraw, Sweet Vernal-grass *Anthoxanthum odoratum*, Tormentil and rare Cow-wheat *Melampyrum pratense*. We did not see Wood Sorrel but the scrub fits the NVC W19a sub-community. On Ingleborough, visited by TMW from 2009 to 2013, the greatest concentration of W19 vegetation is on Moughton in a valley (locally called Juniper Ghyll) running southeast-northwest through Ingleborough SSSI unit 33 and across the watershed to the west onto the more extensive area of unit 82. Most of the Juniper plants are on calcareous *Sesleria albicans-Galium sterneri* grassland (NVC CG9) in limestone pavement and on grassland at the edges of acid heathy patches (NVC M15) where exposed limestone abuts the deeper gleyed soils on the glacial drift of the valley bottoms and small solution hollows. It is absent from the very wet boggy areas in the middle of the valleys. The grassland is mainly acidic with Wavy Hair-grass, Heather, Sorrel *Rumex acetosa*, Heath Bedstraw and occasional Tufted Hair-grass *Deschampsia cespitosa*, Wood Sorrel and Hard-fern *Blechnum spicant*; once again the Juniper is the NVC W19a sub-community. On the western part it mainly grows in more calcareous situations with Blue Moor-grass, Sweet Vernal-grass and frequently Common Sedge *Carex nigra*. Green Spleenwort *Asplenium viride* is often associated and occasionally young plants of the rare Holly-fern *Polystichum lonchitis* can be found under the bushes. This is being monitored by BSBI near SD787716 (P.M. Cannaway, pers. comm.). In addition to the Dales records, JAN has also recorded the tree at High Tarn (NY3404) in the Lake District National Park during 2013, where a small number of old bushes were scattered across Bracken and rush pasture. This area was also showing signs of browning.

Fruits were abundant on the Kisdon sites (See Plate V, centre pages) and on the Browna Gill site in 2013 but not a single fruit was seen on the declining Ingleborough sites. Ward (2007, 2010) reports that the seeds may appear intact on the outside but may not be so within. Only 3.7% of 417 40-year old bushes at Porton Down in October 1998 had normal seeds. She reports that the failure may be due to predation, failure of pollination and/or the nutrient status of the bush. JAN collected one dead Juniper twig at Low Whitta with six species of lichen: *Cladonia fimbriata, Hypogymnia tubulosa, Melanelixia subaurifera, Parmelia sulcata, Physcia adscendens* and *Pseudevernia furfuracea* (determined by Albert Henderson). One old branch had the moss *Hylocomium splendens* but generally the Juniper

had few epiphytes although with many broken branches and others brown with dead wood. The Scrub Management Handbook (Anon, 2003) lists 45 species of lichen, 63 species of invertebrates (26 of them exclusively) and 11 species of Red Data Book birds that are associated with Juniper. Ward (1977) showed a strong relationship between the sizes of Juniper populations and the diversity of insect fauna. Small Juniper stands, e.g. of ≤10 shrubs, are likely to support few Juniper-specific insects unless they are close to large Juniper populations. The larvae of the Ochreous Argent moth *Argyresthia praecocella* feed on the seeds. This is one of seven species of *Argyresthia* moths on the UK list whose larvae live on Juniper, the others making mines in the leaves, buds and twigs. Only three of them have been recorded in Yorkshire. Juniper Argent *A. dilectella* is the most common and, like Triple-barred Argent *A. trifasciata,* is a spreading new arrival, most probably associated with the garden-cultivated Chinese Juniper *Juniperus chinensis*. Gold Juniper Argent *A. aurulentella* occurs in adjacent counties and similarly Downland Argent *A. abdominalis*.

Four Geometrid moths are associated with Juniper including the Juniper Carpet *Thera juniperata*, the Juniper Pug *Eupithecia pusillata* and the Chestnut-coloured Carpet *Thera cognata,* which occur in Yorkshire. The Juniper Carpet is widespread on Chinese Juniper in lowland central Yorkshire but there are few records from the west. The 20+-year old records at Austwick and Malham may have been associated with native Juniper but the only recent record, near Settle by Royanne Wilding, is almost certainly on domestic plantings. Previously there was only a single Yorkshire record of Bronze Argent *Argyresthia arceuthina* and only three of Chestnut-coloured Carpet. The only records of both species in the west were from Austwick over 20 years ago. However the latter was confirmed as resident by TMW while moth trapping for Natural England in the Juniper on nearby Moughton in 2013. Its presence on the Teesdale Juniper has not been confirmed since 1880. Juniper Pug is widespread and common throughout the UK and has increased, associated with garden plantings of Juniper. Its DNA profile has never been investigated and the lowland specimens could be genetically distinct from those from native Juniper sites. The larvae of the rare gelechid Scotch Crest *Dichomeris juniperella* (proposed RDB1) are associated with Juniper, living in tight silk webs the size of golf balls amongst the needles. It has not been recorded in Yorkshire, being confined to the Grampian Mountains in Scotland. In the UK Juniper seeds are killed by several insects and/or mites including the chalcid *Megastigmus bipunctatus*, the Juniper Shieldbug *Cyphostethus tristriatus* and the mite *Trisetacus quadrisetus* which is most easily seen as a slightly swollen and distorted berry with a three-rayed opening with the seeds inside bearing little projections (Redfern and Shirley, 2011). In 2013, bearing in mind that the best estimate was that only one in five bushes appeared to be female at both Low Whitta and Thwaite Stones, most of the female bushes exhibited this mite gall.

All the Juniper areas on Ingleborough are being killed by dieback and *P. austrocedrae* has been confirmed in Juniper Gill and Moughton with devastating consequences for associated species. On a walk-over survey on Moughton in November 2013, TMW estimated that well over 70% of the plants in over 14ha were already dead or moribund (See Plate V, centre pages). Others were showing bronzing of parts of the foliage. How *P. austrocedrae* spreads

is still obscure but it is thought that it can spread through soil and water. Some infected patches of Juniper In the Lake District are often along stream and wet flush lines but on the broken pavements of Moughton such delineation is not obvious. It is probable that much of the Juniper here cannot be saved. If it is not already too late, it is vital that consideration should be given to preserving some of the local populations of rare invertebrates, perhaps by taking them into captive breeding schemes or careful (bio-secure) translocation on to isolated Juniper populations. Anyone accessing Juniper sites should read the FERA leaflet (Anon 2013) and carefully consider and carry out thorough bio-security measures set out there to reduce the risk of the spread of *Phytophthora austrocedrae*.

Acknowledgements

The authors especially wish to thank Dr Lena K. Ward, formerly of CEH Winfrith, who has researched Juniper over very many years for reviewing our paper and making some important additional information available. She has also provided us with a .pdf file of her card index of Yorkshire records, with many extracted from the *Naturalist*. She is quite happy for a serious researcher to see these record cards and enquiries may be made to the authors. Dr Ward is currently making a third revision to the Juniper Biodiversity Action Plan for Plantlife. We also thank Mike Cannaway, Sarah Green, Colin Newlands (NE), Andrew Kirkwood (FERA), YNU and the YDNPA for access to unpublished data.

Bibliography

Abbott, P.P. (2005) *Plant Atlas of Mid-west Yorkshire*. Yorkshire Naturalists' Union.

Anon (1996) *UK Biodiversity Group Tranche 2 Action Plans III plants and fungi*. English Nature [Natural England], Peterborough.

Anon (2001) *National inventory of woodland and trees*. Forestry Commission, Edinburgh: 96pp. Downloads available at: http://www.forestry.gov.uk/forestry/hcou-54pg9u

Anon (2003) *The Scrub Management Handbook, Guidance to the management of scrub on nature conservation sites* (Loose leaf file). Forum for the Application of Conservation Techniques (FACT) English Nature, Wetherby,. [Juniper Section 4.4.28 : 115-118]

Anon (2007) *Report on Species and Habitats Review*. JNCC, Peterborough. Viewed on line at http://jncc.defra.gov.uk/PDF/UKBAP_Species-HabitatsReview-2007.pdf

Anon (2013a) *Phytophthora austrocedrae* Forestry Commission Viewed on line at: http://www.forestry.gov.uk/forestry/infd-8rajz3

Anon (2013b) *FERA Guidance on planting of Juniper in England and Wales in relation to the risk of infection with* Phytophthora austrocedrae, V4.1 (24 Oct 2013), pp 5. Available on line at: http://www.fera.defra.gov.uk/plants/plantHealth/pestsDiseases/documents/phytophthoraJuniperGuidance.pdf

Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D. and Yeo, M. (2004) *An Illustrated Guide to British Upland Vegetation*. JNCC, Peterborough.

Bacon, J. Ed. (2003) *The Scrub Management Handbook*. English Nature, Wetherby.

Backsall, J., Manley, J. and Rebane, M. (2001) *The Upland Management Handbook*. SC 26, English Nature [Natural England], Peterborough. Available on line at http://publications.naturalengland.org.uk/publication/82050

Cheetham, C.A. (1934) The Juniper Problem. *The Naturalist* 59: 83-84.

Clifton, S.J., Ranner, D.S. and Ward, L. (1995) *The conservation of Juniper in Northumbria,*

English Nature Research Reports 152. English Nature [Natural England].
Comley, R., Payne, J. and Payne K.G. (1998) YNU Excursions in 1996 Booze in Arkengarthdale. *The Naturalist*, 123, 38-39.
Corkhill, P. (1998 unpubl. report) *South House Moor – rewilding*. English Nature, Ingleborough NNR, Colt Park Barn.
Dobson, F.S. (2011) *Lichens*, 6th edn. Richmond Publishing Slough.
Dearnley, T.C. and Ducket, J.D. (1999) Juniper in the Lake District National Park, review of condition and regeneration. *Watsonia*, 22: 261-267.
Gilbert, O.L. (1980) Juniper in Upper Teesdale. *J. Ecol*. 68: 1013-1024.
Graham, F. & Cannon, R. (2011 unpubl.) Horton Quarry Juniper planting proposal, YDNPA.
Green, S., Hendry, S.J.H., MacAskill, G.A., Laue, B.E. and Steele, H, (2012) Dieback and mortality of *Juniperus communis* in Britain associated with *Phytophthora austrocedrae*. *New Disease Reports*, 26.
Available on line at: http://dx.doi.org/10.5197/j.2044-0588.2012.026.002
Green, S., Elliot, M. and Hendry, S.J.H. (2013 In prep.) *Phytophthora austrocedrae* emerges as a serious threat to Juniper (*Juniperus communis*).
Horsefield, D. & Thompson, D.B.A. (1994) The Northern Pennines: an Evaluation of Upland Habitats. *English Nature Research Reports*, 64. [ENRR064] English Nature [Natural England], Peterborough.
Preston C.D., Pearman D.A. and Dines T.D. (Eds.) (2002) *New Atlas of the British and Irish Flora: An Atlas of the Vascular Plants of Britain, Ireland, The Isle of Man and the Channel Islands*. 922 pp. Oxford University Press; Har/Cdr edn.
Raatlkainen, M. & Anska, T. (1993) Cone and seed yields of the Juniper (*Juniperus communis*) in southern and central Finland. *Acta botanica fennica*, 149: 27-39.
Redfern, M and Shirley, P. (2011) *British Plant Galls* [2nd edn.] Field Studies Council, Aidgap guide, Preston Montford.
Rodwell, J.S. (1991) *British Plant Communities I Woodlands and Scrub*. Cambridge University Press, Cambridge.
Selman, R., Dodd, F. and Bayes, K. (1999) *A biodiversity audit of Yorkshire and The Humber*. 151 pp. Yorkshire & Humberside Biodiversity Forum, RSPB.
Ward, L.K. (1977) The conservation of Juniper: The associated fauna with special reference to southern England. *Journal of Applied Ecology* 14: 81-120.
Ward, L.K. (2003) *Common Juniper - a UK Biodiversity Action Plan*. Plantlife International, Salisbury, UK.
Ward, L.K. (2007) *UK Biodiversity Action Plan*. United Kingdom. England. Salisbury: Plantlife International, Salisbury, UK.
Ward, L.K. (2010) Variation in ripening years of seed cones of Juniperus communis L., *Watsonia* 28: 11-19.
Webber, J., Green, S. and Hendry, S. (2012) Guidance on planting of Juniper in England and Wales in relation to the risk of infection with *Phytophthora austrocedrae*.
http://www.fera.defra.gov.uk/plants/plantHealth/pestsDiseases/documents/phytophthoraAustrocedrae.pdf
Wilson, M. and Henderson, D.M. (1966) *British Rust Fungi*. UK, Cambridge; Cambridge University Press.
Winder, J.S. (1990) *Moughton: A Juniper Survey*, NCC Report : 20pp. [Natural England], Leyburn, North Yorkshire. Unpublished.
YDNPA (2000) *Nature in the Dales; A biodiversity action plan for the Yorkshire Dales National Park,* Yorkshire Dales National Park Authority, Grassington, Yorkshire.

Plant galls in Swaledale

John Newbould
Stonecroft, 3 Brookmead Close, Sutton Poyntz, Weymouth DT3 6RS.
Tom Higginbottom
5 Spennithorne Road, Skellow, Doncaster DN6 8PF

There is a long tradition of plant gall recording by YNU members in Swaledale, and TH holds the records of the late John Pearson. Over the past five years there have been two VC65 Excursions in the valley, in late July and early August, with reports in *The Naturalist*. JAN has made four recording trips into VC65 between 2009 and 2013, mainly in Swaledale but venturing north to Balderdale and the county boundary along the River Tees at Croft, while some time has been spent in Wensleydale and the Ure valley. In this period a database of c.630 records of galls and related host plants has been accumulated.

The 630 records have been accumulated from 97 1km squares out of a total of 2608 squares in VC65, of which 2330 have more than 75% of their area within the vice-county. The highest number of records in a 1km square is 26 in SE0499 (24 in SE0498). There is some recorder bias here as our accommodation is located in Fremington and there is also some geographical bias in that Fremington is relatively low at 176m. The third best square is the National Trust property at Hudswell Wood (NZ1500) with 22 records. Thwaite (SD8997) and Gunnerside (SD9598) are the highest scorers in the more upland parts with 14 records each. In the associated Arkengarthdale the presence of a number of SSSIs in NY9804 (20 records) and NY9903 (18 records) is a reflection of host species diversity.

The species causing galls are specific to their host plants. The gall causer (be it animal or fungal) must be able to invade and hijack the tissues of its host at precisely the correct stage of the development of each. If the synchronisation fails due to a mismatch of timing then the strategy will fail and the gall causer will not find another host to complete that stage of its life cycle. Therefore, adverse weather delaying plant development can be a factor (Redfern, 2011). For example, the gall *Cecidophyes rouhollahi* on Cleavers *Galium aparine* was found 16 times in 2012 but just once in 2013, when we were in Swaledale at a similar time. It was not seen at all in 2009 or 2011 when we visited in August and Cleavers had died back.

326 of JAN's records relate to gall mites, 79 to gall midges and 65 were fungal galls. In total 61 host plants were recorded of which 23 were trees or shrubs, including six species of willow, and two species of grass both hosting *Aceria tenuis* (at Thwaite in 2011 and Ravenseat in 2012). 107 of the records on trees and shrubs were on Hawthorn, 56 on Alder, 53 on Sycamore, 48 on Ash, 35 on Rowan, 19 on willow and 14 on birch with just 7 records on oak, which is scarce in the upper dale.

Of particular interest are the fungal galls. The Nettle Clustercup rust *Puccinia urticae,* which forms a brown swelling on the stems of Stinging Nettle *Urtica dioica,* was seen eight times

but only in the early July visits in 2012-13. It is usually found in marshy grassland where sedges such as Common Sedge *Carex nigra* or Hairy Sedge *C. hirta* will act as co-hosts (Wilson and Henderson, 1966). Sweet Cicely *Myrrhis odorata* is a common neophyte of roadside verges in the dale but the gall *Puccinia chaerophylli* has only been recorded on two occasions. Alder supports three *Taphrina* fungal galls but JAN only recorded Alder Tongue *Taphrina alni* on catkins at Gunnerside in 2011, whilst TH found *T. sadebeckii* in Rowleth Great Wood at the same time. Another is *Taphrina wiesneri* on Bird Cherry *Prunus padus* whilst the Birch Besom witches' broom on Silver Birch *T. betulina* is scattered across the vice-county. Meadowsweet *Filipendula ulmaria* is a common plant of wet places but the orange rust *Triphragmium ulmariae* is easily overlooked amongst what can be quite dense vegetation, with just two records.

The fungus *Gymnosporangium cornutum* galls the undersides of the leaves of Rowan (see back cover), forming rounded orange-yellow swellings bearing horn-shaped aecia up to 5mm long. According to Dr Margaret Redfern and Dr Brian Spooner (pers. comm.) these galls are most frequent in parts of Scotland and much rarer further south. There are past records by John Pearson from Arkengarthdale and Middleton-in-Teesdale, and more recent ones from the Ballowfields, Wensleydale (2010) while JAN has records from Swaledale in 2013. The alternative fungal host is Juniper and there are colonies in Arkengarthdale, Swaledale and Teesdale. Juniper is also the alternative host for *G. clavariforme* on Hawthorn leaves, although there is only a single record from 2012.

Even though oaks are less common in Swaledale there have been some interesting gall records. By the Coast to Coast footpath at Applegarth, northwest of Richmond, the aptly named Cottonwool Gall *Andricus quercusramuli* has been recorded on oak catkins (see Plate VIII, centre pages). A mass of white hairs up to 30mm across completely obscures the gall chambers. *A. quadrilineatus,* another less common gall on the oak catkins, has been discovered in Arkengarthdale. The midge *Dasineura acrophila* folds an Ash leaflet into a pod shape and has been found in the Richmond area. Mountain Currant grows on the Carboniferous Limestone beside the bridle path along the north bank of the Swale in Richmond. The aphid *Cryptomyzus korschelti* causes reddish thickened patches on the leaves (Plate VIII, centre pages). In a field near Easby Abbey in 1993 the midge *Rhopalomyia millefolii* was discovered forming an ovoid gall in the leaf axil of Yarrow. Wild Thyme is common in the area and the leaves are frequently covered in white cottonwool-like hairs caused by the mite *Aceria thomasi*.

We acknowledge the assistance of Bill Ely and Adrian Norris in helping to find galls during our surveys.

Bibliography:

Redfern, M. (2011) *Plant Galls*. New Naturalist no 117. Collins, London
Redfern, M. and Shirley, P. (2011) *British Plant Galls* Field Studies Council Aidgap, Preston Montford.
Spooner, B. and Roberts, P. (2005) *Fungi* New Naturalist Library no 96. Collins, London.
Wilson, M. and Henderson, D.M. (1966) *British Rust Fungi* Cambridge University Press, Cambridge.

Progress with the study of *Rubus fuscus* and the *Rubus fruticosus* aggregate in Swaledale and neighbouring districts

David Earl 25 Outram House, St. Mary's Avenue, Walton-le-Dale, Preston, Lancashire, PR5 4UR
email: david.earl@talktalk.net

At a national level the most noteworthy *Rubus* species to be found along Swaledale is *Rubus fuscus*. Until relatively recently this species was only known to occur in two 10km squares in the Richmond area of North-west Yorkshire (VC65) these being SE19 and NZ10. Early voucher specimens of a bramble with bright pink flowers and red-based styles were collected from Billy Bank Wood and Hipswell Lodge by J Ward in 1866 and are held at Manchester Museum (MANCH). Having viewed these specimens at MANCH Alan Newton visited the Richmond area during the early 1970s to trace the bramble collected by Ward. Newton later classified Ward's gatherings as *Rubus fuscus* in 1976. The Richmond population of this bramble is most intriguing as the nearest known population occurs as an isolated record somewhat further south in Nottinghamshire (vc56) with the main British populations occurring in several counties to the north of London (*Newton & Randall* 2004). At an international level the distribution of *Rubus fuscus* is classed as widespread in north-western Europe (*Edees & Newton* 1988).

Whilst in the Richmond area in 2003 my wife and I carried out a few bramble forays and were able to find *Rubus fuscus* about Richmond in woods at Rimmington Avenue (NZ1800) and Scotton (SE1895) thereby updating the historic records. Exploration of woods at Catterick Garrison provided a first record for VC65 of *Rubus pallidus*. In addition *Rubus latifolius* was found in a hedgerow by a sand and gravel pit at Scorton (NZ2400) and at Scotch Corner (NZ2005), again new records for VC65.

The opportunity to explore Swaledale further arose again in 2012 when efforts were made to find *Rubus fuscus* in some additional 10km squares. The obvious places to look were the woods along the valley with populations being discovered to the west of Richmond within NZ00 at Marske and within SE09 at Stainton Woods and Reels Head. The big surprise was a population a considerable distance to the west within SD99 by the river at Muker (SD9097).

During 2013 more extensive explorations along Swaledale were carried out. The emphasis was mainly that of tetrad recording for *Rubus fuscus*. To the west of Brompton-on-Swale a continuity of records at the tetrad level is now known to extend from the banks of the River Swale at Fremington (SE0598) to Colburn (SE1999) with some strong populations occurring along wooded lanes and in plantations above the Swaledale valley particularly about Vicars Green and between Richmond Out Moor and Gilling Wood (NZ1504). No additional sites were discovered between Fremington and Muker.

The main discoveries were however to the east of Richmond in SE29 with scattered populations occurring close to the River Swale from Brompton-on-Swale to Catterick and a

major population occurring in the woods and lanes about Kirkby Fleetham and Kiplin. A few plants were also found within SE39 along a wood border at Streetlam (SE3098). Several visits were made to locations between Swaledale and Teesdale but *Rubus fuscus* was only found at a new northern limit within NZ20 along a roadside at Middleton (NZ2106). The most southern known location for *Rubus fuscus* in VC65 is a wood border at The Wham (SE1491). Figures 1 and 2 show the improvement in our knowledge of *R.fuscus* distribution in VC65 between June and October 2013.

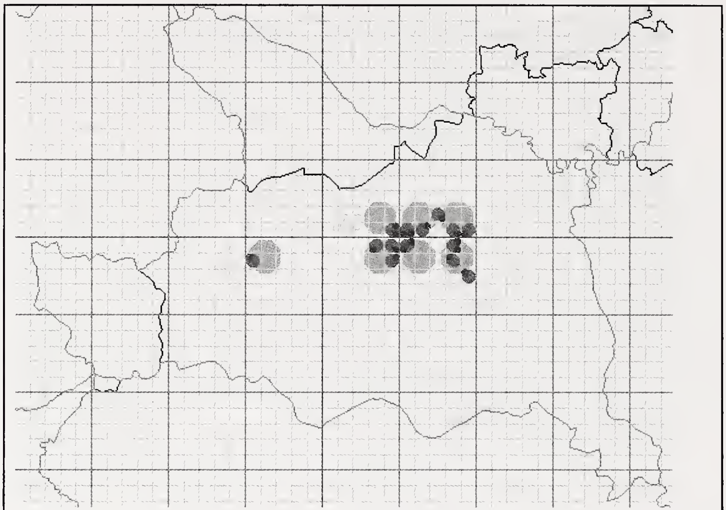


Figure 1. *Rubus fuscus* June 2013

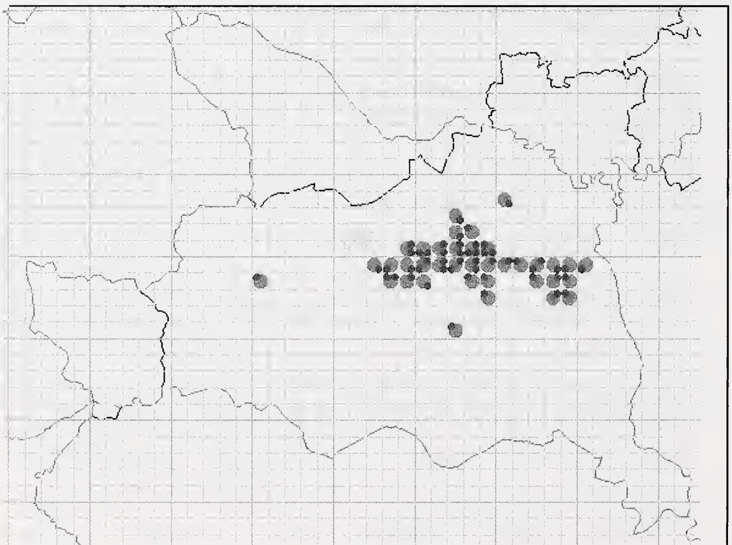


Figure 2. *Rubus fuscus* October 2013

Additional *Rubus* discoveries were also made whilst in Swaledale. New records for VC65 include a good population of *Rubus mucronulatus* at Fatten Hill Plantation (SE2798); *Rubus bartonii* on a wood stream bank at Catterick Garrison (SE1897, DP Earl & E Pickles); *Rubus halsteadensis* first found at Kirkby Fleetham Hall (SE2795) and later found by the river banks at Brompton-on-Swale (SE2199). *Rubus lanaticaulis* may also have been found at Reeth (SE0399) but this record requires confirmation.

It is intended that further visits will be made to the Swaledale area during 2014 and that a further article on recent *Rubus* discoveries in Yorkshire will also be compiled.

A Review of the Molluscs collected on field trips to VC65 between 2009 and 2013

Adrian Norris
email: AdrianXNorris@aol.com

These trips occurred in July 2009, August 2011, July 2012 and July 2013, the trip in 2010 being in association with the NFBR conference held in Windermere. An examination of these records suggest that many species are very local and hard to locate with eleven of them being recorded only once during the four years: Point Snail *Acicula fusca,* Southern Garden Slug *Arion hortensis* s.s., *Euconulus alderi,* Lapidary Snail *Helicigona lapicida,* Yellow Slug *Limacus flavus,* Glossy Glass Snail *Oxychilus navarricus helveticus,* Keeled Slug *Tandonia sowerbyi,* Pfeiffer's Amber Snail *Oxyloma elegans,* Marsh Whorl Snail *Vertigo antivertigo* and Wall Whorl Snail *V. pusilla*. A further four were recorded only twice: Prickly Snail *Acanthinula aculeata,* Irish Yellow Slug *Limacus maculatus,* Draparnaud's Glass Snail *Oxychilus draparnaudi* and Ash-black Slug, although the latter may consist of more than one species. Three-toothed Moss Snail and Durham Slug *Arion flagellus* were only recorded three times each; Clear Glass Snail *Aegopinella pura,* Wrinkled Snail *Candidula intersecta* and Striated Whorl Snail *Vertigo substriata* on four occasions; Large Amber Snail *Succinea putris* and Eccentric Grass Snail *Vallonia excentrica* on five occasions; Budapest Slug *Tandonia budapestensis,* Toothless Chrysalis Snail *Columella edentula* and Common Whorl Snail *Vertigo pygmaea* on six occasions and Short-toothed Herald Snail *Carychium minimum* and Dwarf Snail *Punctum pygmaeum* on seven occasions.

Some of these are genuinely rare in Yorkshire. The Southern Garden Slug is a segregate which appears to be very uncommon in Yorkshire with most old records now disregarded. Others such as Yellow Slug are rarely found during the day and may be far more common than this survey indicates. A lack of their specific habitat requirements may have caused the lack of records of the glass snail *Euconulus alderi,* Pfeiffer's Amber Snail, Wrinkled Snail and Short-toothed Herald Snail. Wrinkled Snail requires dry sandy habitats and was almost

always found close to old railway lines whilst all the others are marginal snails of wet habitats. Some, such as Durham Slug, have only recently reached into Yorkshire and are still spreading out through our countryside whilst others, such as Budapest Slug, have been known for over eighty years and yet are only found close to human disturbance.

The most common molluscs were Smooth Glass Snail *Aegopinella nitidula,* Great Black Slug *Arion ater* both *agg. and seg.*, Dotted Slug *A. circumscriptus,* Common Garden Slug *A. distinctus*, Hedgehog Slug *A. intermedius,* Dusky Slug *A. subfuscus, Balea heydeni,* White-lipped Snail *Cepaea hortensis,* Slippery Moss Snail *Cochlicopa lubrica,* Netted Slug *Deroceras reticulatum,* Rounded Snail *Discus rotundatus,* Common Chrysalis Snail *Lauria cylindracea,* Garlic Snail *Oxychilus alliarius,* Hairy Snail *Trochulus hispidus* and Strawberry Snail *Trochulus striolatus*. The most common was Netted Slug with 118 records.

The Nature Reserve at the Hudswell Woods complex, in particular Billy Bank Wood (NZ1600) and Calfhill Wood (NZ1500), produced a number of rarities on 14.07.2012 including Point Snail, Three-toothed Moss Snail, Plaited Door Snail, Dwarf Snail, Ash-black Slug and Southern Garden Slug. Clapgate Gill (NZ115023) on 02.07.2013 produced live specimens of Lapidary Snail and the scarce Craven Door Snail *Clausilia dubia*. Croft–on-Tees (NZ2810 & NZ2809) produced specimens of Large Amber Snail at several sites on 14.07.2012.

Gunnerside Gill (SD9598 & SD959) on 13.08.2011 produced Yellow Slug very close to an old building at the foot of the gill at SD95089833 while further up the Gill we recorded Prickly Snail, Silver Slug *Arion silvaticus*, Craven Door Snail, Plaited Door Snail, Toothless Chrysalis Snail and Striated Whorl Snail. Three-toothed Moss Snail, Toothless Chrysalis Snail, Common Whorl Snail and Striated Whorl Snail were also recorded at this site (SD94799776) on 24.07.2009, as was a possible Ash-black Slug at SD94559911. A specimen of the latter was forwarded to a specialist on this group who stated that it was new but, as yet, no name has been produced.

Ivelet, Swaledale (SD93559828) on 24.07.2009 produced Dwarf Snail, Marsh Whorl Snail and Common Whorl Snail. The area surrounding Keld (NY8900, NY8901 and SD8999) on 25.07.2009 produced Pfeiffer's Amber Snail, Dwarf Snail and Large Amber Snail as well as the rare Wall Whorl Snail, which was recorded on a wall at Keld (NY89550105). Langthwaite Scar (NZ00510236) on 12.08.2011 had Glossy Glass Snail. Moss Bridge on the A684 (SD82639229) produced the only specimen of *Euconulus alderi* on 05.07.2013. The B6270 near Muker (SD924975) on 13.07.2012 had Three-toothed Moss Snail. Reeth Village Green (SE039991) produced large numbers of Eccentric Grass Snail along with Keeled Slug and Draparnaud's Glass Snail on 14.08.2011. Stang Forest (NZ023084) on 12.07.2012 turned up specimens of Dwarf Snail, Common Whorl Snail and Striated Whorl Snail. Thornborough Henge (SE285791) produced specimens of Eccentric Grass Snail and Common Whorl Snail on 06.07.2013. Thwaite (SD882980) on 03.07.2013 had Irish Yellow Slug and Common Whorl Snail whilst Thwaite Stones also produced Large Amber Snail and Silver Slug.

From these four trips we (David Lindley, Terry Crawford, Tony and Moira Wardhaugh and myself) recorded 1,493 records of 64 species of mollusc.

Hudswell Wood, Richmond, North Yorkshire

John Newbould[1], **Adrian Norris**[2] and **Seb Mankelow**[3]
[1]email: johna72newbould@yahoo.co.uk
[2]email: adrianxnorris:aol.com
[3]National Trust ranger

Introduction

Hudswell Wood and the associated Hag Wood are owned by The National Trust, which has undertaken a number of nature conservation evaluations over the years. Reports relevant to these woods are Usher & Priest (1977), Scruby & Alexander (1987) and Hewins & Foster (1999). In addition, there have been contributions by Roy Crossley (1992,1993) and Alan Legg through his series of mycological reports published in *Bulletins of The YNU* 1993-2002. The National Trust aims to update its conservation evaluations on a twelve-year rolling cycle but, with a small bio-survey team based at Swindon and nearly 900 properties throughout England, Wales and Northern Ireland, this target is hard to meet.

Key features and species of nature conservation value.

BAP habitats present:

- Rivers and Streams: the River Swale forms the northern boundary with breeding Kingfisher *Alcedo atthis* and feeding Spotted Flycatcher *Muscicapa striata*.
- Boundary and Linear Features: the meadows have unmanaged hedges. Broad-leaved, Mixed and Yew Woodlands: a large extent of lowland mixed deciduous woodland with a history of woodland cover which has not changed since the 1st edition of the OS map in 1857, part of a series of woods in the lower Swale valley. The important plants include Large-leaved Lime *Tilia platyphyllos,* considered to be native here by Usher and close to its northern limit, Alpine Currant *Ribes alpinum* with Wood Barley *Hordelymus europaeus* in Calfhall Wood but Globeflower *Trollius europaeus* is no longer present in Hag Wood. There is woodland edge habitat on the river bank.
- Calcareous and Neutral Grassland: includes Greater Burnet *Sanguisorbia officinalis.* Prickly Sedge *Carex muricata* ssp. *muricata* (near threatened) is reported from the property but we did not trace it in 2013.
- Inland Rock: numerous limestone crags hidden amongst the woodland with crevices; shingle on the south bank of the River Swale is important for scarce invertebrates.

Mammals
A data search from the North and East Yorkshire Ecological Data Centre reported the presence of both Otter *Lutra lutra* and Water Vole *Avicola terrestris* on the Swale. The area may well provide good habitat for bats with crevices in the limestone crags and numerous old trees. The National Trust organised a bat survey at Hudswell Wood in August 2013 and reported Noctule *Nyctalus noctula*, Daubenton's *Myotis daubentoni,* Soprano Pipistrelle *Pipistrellus pygmaeus* and Common Pipistrelle *P. pipistrellus* (Tim Bailey *pers. comm.*).

Birds Seb Mankelow
Eight red-listed birds (Eaton *et al.* 2009) have been reported from the property together with a number of amber-listed ones. Six are on the UK BAP priority list. JAN recorded a single Yellow Wagtail *Motacilla flava flavissima* just below Hudswell Bank in July 2012. SM reported about eight pairs of Marsh Tit *Poecile palustris* in 2013. This bird, described by Thomas (2013) as preferring mature broad-leaved woodland, is an uncommon resident. Red-listed thrushes are present in good numbers including Song Thrush *Turdus philomelos* and wintering Fieldfare *T. pilaris* and Redwing *T. iliacus* along with the amber-listed Mistle Thrush *T. viscivorus*. Birds breeding in the vicinity of the river include Dipper *Cinclus cinclus*, Kingfisher (bred by the footbridge in 2013), Goosander *Mergus merganser*, Common Sandpiper *Actitis hypoleucos*, Sand Martin *Riparia riparia*, Grey Wagtail *Motacilla cinerea* and Pied Wagtail *M. alba yarrellii*.

The usual woodland/garden birds are well represented. Bullfinch *Pyrrhula pyrrhula* (an amber-listed BAP species) seems to have been very successful in 2013 with several fledged families being observed. There are certainly 2 or 3 resident pairs on the site, increasing to small flocks of 4 or 5 birds in the winter. Nuthatch *Sitta europaea* appears to be increasing and good numbers of Tree Creeper *Certhia familiaris* are also present. All three woodpeckers were resident although there have been no records of Lesser Spotted since the 2011/2012 winter (it was not reported by Thomas (*loc. cit.*) for VC65 and is declining nationally).

Summer visitors include the usual warblers: Willow Warbler *Phylloscopus trochilus*, Chiffchaff *P. collybita*, Garden Warbler *Sylvia borin*, Blackcap *S. atricapilla* and occasional passage Sedge Warbler *Acrocephalus schoenobaenus* in the river scrub. Spotted Flycatcher was seen feeding over the River Swale during the YNU survey with several pairs reported by SM around Calfhall Wood. Pied Flycatcher *Ficedula hypoleuca* is becoming increasingly uncommon (Thomas *loc. cit.*) but pairs breed several kilometres upstream of Hudswell Woods and may be encouraged on to the site with a recently established bird box scheme. Redstart *Phoenicurus phoenicurus* is seen occasionally on the southern edge of the site but seems to move on to breed. Swifts *Apus apus* and Swallows *Hirundo rustica* were feeding over the river and grassland during the YNU survey.

There is much Tawny Owl *Strix aluco* activity in the woodland areas; Sparrowhawk *Accipiter nisus* breeds in Calfhall Wood and Kestrel *Falco tinnunculus* feeds on riverside meadows.

Raven *Corvus corax* occasionally visits the trees favoured by Jackdaw *C. monedula* in Round Howe Wood.

Winter visitors include: Siskin *Carduelis spinus*, Lesser Redpoll *C. cabaret* and Brambling *Fringilla montifringilla*. Numbers of Woodcock *Scolopax rusticola* increase in the winter with birds frequenting the dense wet areas; five were observed one morning in spring 2013 making the most of wet soil/melting snow. Crossbill *Loxia curvirostra* is also an irregular winter visitor.

Mollusca Adrian Norris, David Lindley and Terry Crawford.
Lesser Bullin *Merdigera obscura* (previously known as *Ena obscura*) and Brown Snail *Zenobiella subrufescens* had been recorded in 1987 but were not re-found on the YNU survey. The former is known to be locally distributed, can be very scarce and is rarely found in numbers. It is not known as a 'boom and bust' species but may have been down in numbers at the time of our visit. The latter is a late summer/autumn snail which may have been young and difficult to find.

The most important molluscs that we did find were single examples of Three-toothed Moss Snail *Azeca goodalli* (Billy Bank Wood) which is fairly rare in Yorkshire while Ash-black Slug *Limax cinereoniger* (Calfhall Wood) is fairly common and widespread in old/ancient woodland. The former lives in damp moss in fairly open woodland, thus is usually found at the edges of woods often open to the sun. The latter is usually found under/in/close to old fallen logs. Several species of 'Ash-black Slug' may be found to occur in Britain and a closer study of all its records may be required.

Other old woodland molluscs were also located, including Plaited Door Snail *Cochlodina laminata* and several introduced pests including Worm Slug *Boettgerilla pallens,* Budapest Slug *Tandonia budapestensis* and Common Garden Snail *Cornu aspersum.* Only two species were located in the river: River Limpet *Ancylus fluviatilis* and Horny Orb Mussel *Sphaerium corneum*.

Lepidoptera
During the survey on 4th July, 2013 we noted three butterflies: Large Skipper *Ochlodes sylvanus*, Ringlet *Aphantopus hyperantus* and Speckled Wood *Pararge aegeria*. In early August 2013 there was an unconfirmed report of White-letter Hairstreak *Satyrium w-album* from the car park. During the July survey Terry Crawford noted over 30 Chimney-sweeper moths *Odezia atrata*.

Plant Galls John Newbould
38 invertebrate plant galls were recorded in July 2012-13. *Aceria fraxinicola* on Ash is not featured on the NBN Gateway at all but was recorded in Swaledale in 2012. Cherry Gall *Cynips quercusfolii* is not on the NBN Gateway from Watsonian Yorkshire north of South Yorkshire but *Cynips* galls have not appeared much during the past five years, though they

have shown up in Yorkshire and elsewhere in 2013. The sawfly *Pontania (Eupatonia) herbaceae*, found on Goat Willow *Salix caprea* by the river in 2013, is an upland gall-causer described by Redfern & Shirley (2011) as common but the only UK records on the Gateway are in Scotland.

Broad-leaved woodland

The property has a number of woodland compartments including: Billy Bank Wood, Round Howe, Round Howe Wood, Calfhall Wood and Hudswell Banks.

Billy Bank Wood John Newbould and David Earl

This wood is located at the eastern end of the property in NZ1600 on a north-facing slope with a rock exposure with the potential for bat roosts in the holes. There is a circular path aound the wood but care is needed in wet weather due to rock outcrops on the path. The north boundary is the river.

The wood is mainly Ash–Sycamore–Wych Elm woodland with Large-leaved Lime (Hemsley, 1982). Alpine Currant forms an extensive shrub layer to the south of the upper path but Gooseberry *Ribes uva-crispa* is scarce. There is an occasional Yew *Taxus baccata* with an extensive shrub layer of Wych Elm *Ulmus glabra* re-growth; Hawthorn *Crataegus monogyna*, Hazel *Corylus avellana* (scarce), Holly *Ilex aquifolia* and occasional Elder *Sambucus nigra* with Field Maple *Acer campestre* (scarce) also present in the shrub layer. In areas of bare ground there were numerous Sycamore *Acer pseudoplatanus* leaves and Wych Elm seeds. However, these seeds rapidly loose viability but germinate better in low light (Grime *et al.* 2007). Bird Cherry *Prunus padus* is rare and some Beech *Fagus sylvatica* and larches have been introduced. Dead wood is scattered through the wood. Wet flushes within the woodland contain Opposite-leaved Golden-saxifrage *Chrysosplenium oppositifolium,* Wavy Bitter-cress *Cardamine flexuosa* with Marsh Hawk's-beard *Crepis paludosa* in a flush by the river. There is Alder woodland adjacent to the river. The woodland forms typical NVC community W8f.

The ground flora is mainly Ramsons *Allium ursinum* with Tufted Hair-grass *Deschampsia cespitosa*, Wood False-brome *Brachypodium sylvaticum* (rare), Bearded Couch *Elymus caninus* and Giant Fescue *Festuca gigantea*. Nettle *Urtica dioica* and bramble *Rubus fruticosus* agg. occur mainly where elm has died back. Hard Shield-fern *Polystichum aculeatum,* Soft Shield-fern *P. setiferum*, Male Fern *Dryopteris affinis,* Common Buckler-fern *D. dilatata* and Hart's-tongue *Phyllitis scolopendrium* are scattered throughout the wood but always scarce. Great Wood-rush *Luzula sylvatica* found by Usher in 1977 is still present.

Woodland specialities include Wood-sedge *Carex sylvatica*, Bluebell *Hyacinthoides non-scripta*, Woodruff *Galium odoratum*, Dog's Mercury *Mercurialis perennis*, Wood Speedwell *Veronica montana* and Wood Sorrel *Oxalis acetosella*. Usher described this area as also containing Wood Crane's-bill *Geranium sylvaticum*. David Evans recorded Giant Bellflower *Campanula latifolia,* a northern plant, and Deadly Nightshade *Atropa belladonna*.

Crossley (1992, 1993) reported nine scarce flies from along the woodland edge bordering the river, some associated with damp woodland, others with river edges. Most are small dance flies and amongst the more notable were *Platypalpus cothurnatus* and *P. subtilis.* He also recorded the nationally scarce Lime Beetle *Stenostola dubia*, a longhorn which is almost exclusively associated with mature limes, the larvae boring in the smaller branches.

Grassland John Newbould

The property contains some significant areas of unimproved grassland, though sometimes coarse and scrub-invaded. These are an important wildlife habitat, mainly located in the eastern portion of the site and well used by visitors, and as such are a valuable feature of the property. Although located in the flat flood plain they rarely flood. There are a number of old hedges forming field boundaries which have not been managed. Adjacent to the river is mainly scrub but a small number of open areas have sand and shingle, forming important invertebrate habitat. There has been a considerable deterioration in grassland habitat since 1977 which is presently being addressed in conjunction with a Buglife project *Bugs alive,* sponsored here by the SITA landfill trust.

Grassland east of Round Howe (NZ1600)

A large area of rank grassland east of NZ161009 had been recently cut and raked off, leaving few herbs. The riverbank had been substantially eroded at NZ163009, following the heavy rainfall in 2012. There is a north-south hedge with a northerly locus NZ161008 consisting of Hazel, Hawthorn, Ash, Blackthorn *Prunus spinosus*, bramble, Wych Elm and Elder with Nettle and Rosebay Willowherb *Chamerion angustifolium* with Dog's Mercury in places.

Alder *Alnus glutinosa* is common by the river and nearby is one Butterfly Bush *Buddleja davidii* with a small amount of Gorse *Ulex europaeus*. Butterfly Bush is an alien which should be monitored. Although excellent for late summer butterflies it spreads and can easily become a pest.

The grassland is really dominated by the coarse MG1 community of False Oat-grass *Arrhenatherum elatius* and its allies. However, herbs such as Common Knapweed *Centaurea nigra*, rare Foxglove *Digitalis purpurea* by woody vegetation, Common Cat's-ear *Hypocharis radicata*, Restharrow *Ononis repens,* Greater Burnet, Lady's Bedstraw *Galium verum*, White and Purple Clovers *Trifolium repens* and *T. purpureum* are still present. By the river banks the herb vegetation is richer with Meadow Crane's-bill *Geranium pratense*, Meadowsweet *Filipendula ulmaria* and Marsh Hawk's-beard *Crepis paludosa* in damper places. Although Meadow Crane's-bill and Greater Burnet are both essentially lowland plants, they may be found in the Pennine uplands (Peterken, 2013).

A broken hedgerow with a standard Ash together with Elder and Hawthorn stands on a shallow bank with a north-south orientation starting from a locus of NZ162009. The ox-bow of the River Swale sweeps south-east here with a shingle and sandy bank adjoining the field with a potential for riverside invertebrates.

References

Crossley, R. (1992) *Hudswell Woods, North Yorkshire. Entomological Survey 1992.* Report to the National Trust.

Crossley, R. (1993) *Hudswell Woods, North Yorkshire. Entomological Survey 1993.* Report to the National Trust.

Eaton, M A , Brown, A.F., Noble, D.G., Musgrove, A.J., Hearn, R., Aebischer, N.J., Gibbons, D.W., Evans, A. & Gregory, R.D. (2009) Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. *British Birds* 102, 296–341

Grime, J.P., Hodgson, J.P. & Hunt, R. (2007) *Comparative Plant Ecology.* Second edition, Castlepoint Press, Dalbeatie

Hemsley, J. (1982) Distribution map of large-leaved lime at Hudswell. Unpublished.

Hewins, E.J. & Foster, A.P. (1999) *Hudswell North Yorkshire. National Trust Biological Survey.* Unpublished.

Legg, A.W. *et. al.*, (1993-2002) Fungi records from VC65. Extracted from the *Bulletin of the YNU.*

Legg A.W. (1993) BMS day foray report: Hudswell Woods, Richmond, North Yorkshire 10 October 1992. *The Mycologist,* 7, p99

Peterken, G.F. (2013) *Meadows.* Gillingham, British Wildlife Publishing

Redfern, M. & Shirley, P. (2011) *British Plant Galls,* 2nd edn Preston Montford, Field Studies Council Aidgap guide.

Rodwell, J. (1991-2000) *British Plant Communities I-V,* Cambridge, Cambridge University Press.

Scruby, M. & Alexander, K. (1987) *Hudswell North Yorkshire. National Trust Biological Survey.* Unpublished.

Thomas, C.C. (ed.) (2013) *Yorkshire Bird Report 2011.* Yorkshire Naturalists' Union, York.

Usher, M.B. & Priest, S.N. (1977) *Survey of National Trust properties for their wildlife conservation importance.* Dept. Biol., Univ. York.

Helen Kirk BEM

In the 2013 New Years Honours list YNU member Helen Kirk, volunteer Executive Secretary of the Thorne and Hatfield Moors Conservation Forum, was awarded the British Empire Medal for services to Conservation.

The investiture, performed by the Lord Lieutenant of South Yorkshire, David Moody, took place on 4 October 2013 on the remote, wild and windswept landscape of Thorne Moors, in the Humberhead levels, near Doncaster. The event, attended by friends from Conservation, Natural History and Community organisations, was hosted by Natural England with Ian Carstairs of the Carstairs Conservation Trust acting as master of ceremonies.

Following Helen's Investiture Caroline Flint, MP for the Don Valley, and Craig Bennett, Director of Policy and Campaigns for Friends of the Earth, spoke of their recollections of working with Helen in the battle to safeguard our threatened peatland and its wildlife.

CAH

Book Review

Feral – Searching for enchantment on the frontiers of rewilding by **George Monbiot** 2013. Pp317. Published by Allen Lane, London

Landscape-scale conservation initiatives, like the Great Fen project and Natural England's Nature Improvement Areas, are increasingly seen as a necessary component in the armoury to protect and enhance our biodiversity. George Monbiot's book, *Feral*, argues for what some would consider is the logical conclusion to this process, re-wilding. When applying this to ecosystems, he is not concerned with restoring them to some kind of prior, 'natural' state but permitting ecological processes to resume unhindered, as far as possible. He also advocates 'rewilding of human life', not, he emphatically states, by shedding civilization but providing greater opportunities for people to reconnect with and experience real nature.

Monbiot's book is a rather unconventional mix of academic discussion and autobiographical narrative, the latter written in vivid, and sometimes quite poetic, prose. The former is supported by quite an extensive and diverse list of references, although, interestingly, he doesn't use the mounting body of evidence for the psychological benefits of contact with nature in support of the re-wilding of human life. Nonetheless, one among many of the interesting ideas he discusses is the suggestion that the ability of many of our native broadleaved trees to re-shoot from the ground when trunks are 'removed' (allowing the practice of coppicing) was an adaptation allowing them to survive the impact of the straight-tusked elephant before it became extinct in Europe about 40,000 years ago. He argues strongly for the re-introduction of equivalent large mammals, including carnivores like the wolf and lynx, to facilitate the kind of ecosystem processes that occurred before such species disappeared. He supports this partly through the concept of keystone species, those that have a larger impact upon their environment than numbers alone would suggest. He also muses on the trophic cascade concept, whereby fauna at the top of a food chain 'can transform the places in which they live', changing many biotic and abiotic components of the ecosystem.

There is little direct reference to Yorkshire, apart from using the catching of Bluefin tuna, up to 850lbs in weight, off the Scarborough coast in the 1930s, as an illustration of what has happened to the marine environment in the second half of the 20th century. However, some of his pet ambitions could certainly be applied to the Yorkshire uplands, particularly his desire for the removal of European-subsidised sheep from his beloved Cambrian mountains to allow natural re-vegetation to occur, an idea which has recently gained traction elsewhere as part of a suggested landscape management strategy to alleviate the kinds of disastrous floods we have experienced this winter.

I found the book very easy to read and was frequently quite enthralled to find out what the next chapter contained. It won't be to everyone's taste but it certainly has some stimulating ideas and is undoubtedly thought-provoking.

AM

Obituary: Douglas Turnbull Richardson, C.Chem., M.R.S.C. (29.03.1919 – 13.12.2013)

Douglas was born in Thornton, Bradford, Yorkshire, the son of Alfred William Richardson, a Master Cabinet Maker. His training as an apprentice to the City of Bradford Public Analyst began in 1936 but was interrupted by World War II, in which he served as a laboratory Petty Officer in the Royal Navy, specialising in pathology and parasitology.

On return to civilian life he had a brief spell back at Bradford Technical College where, on St Valentine's Day 1946, the laboratory superintendent introduced him to a young lady called Marion, who was experiencing her first day in the chemistry department stores, and told him to look after her. He obeyed the order in full and they married in January 1948. He spent the next decade as senior quality control chemist at one of Bradford's leading wool combing organisations. This was followed by a decade as chief chemist of a specialist filtration firm with connections with the brewing, wine, spirit and pharmaceutical trades, a job which took him round the world on all manner of trouble-shooting missions. It was during this period that he achieved his schoolboy ambition and was elected an Associate of the Royal Institute of Chemistry. After a series of other posts, and still with 14 years to retirement, he became analyst to the Reader in Mineralogy, Department of Earth Sciences, University of Leeds. Douglas revelled in working with academic staff looking at all manner of exciting strategically important minerals: uranium, tungsten, tantalum, gold, platinum, rare earths and diamonds, to mention but a few.

Douglas's background subsequently took him into the fields of caving and researching the local lead mines. This wasn't a simple fascination with underground adventure but a serious interest in surveying the network of local caves and discovering the flora and fauna which inhabited these dark spaces. In 1954 he was a founding member of the White Rose Pothole Club, which still thrives and is now one of the top three potholing societies in the United Kingdom. He was also a co-founder of the Northern Cavern and Mine Research Society which is also still going strong and has gained international recognition under the title Northern Mine Research Society.

Like many with an active mind and passionate interests, retirement meant a flourish of activity in all those pursuits previously suppressed by the need to earn a living. He had always loved nature, a passion he shared with his father who first fostered his interest and which he took great delight in sharing with others. He joined the Yorkshire Naturalists' Union in 1973 and his commitment was soon noticed. He became Convener of the Other Arthropods Committee in 1984 and stayed in that post until 1996 but remained as Recorder for several groups. In 1984 he also became a joint editor of the *Bulletin of the YNU*. Always interested in combining his many skills he threw himself into recording the distribution of invertebrates, in particular woodlice, centipedes, millipedes, harvestmen, leeches and freshwater flatworms, and for ten years he ran the National Millipede Recording Scheme. This resulted in a complete survey of the county and the establishment of the distribution schemes for these groups, as well as many other similar organisms which he placed firmly

on the map.

Over the years he built up large collections of invertebrates which he presented to the Leeds City Museum in 1975. The bulk of this material is preserved in spirit and is the basis for the field records for Yorkshire. Douglas also worked on the Leeds City Museum's collections of microscope slides, documenting and restoring them and noting many rare and valuable examples. In April 2009 at the age of 90, following a setback in health, he took the decision to downsize much of his home laboratory and, after consultation with several museums and societies, donated his collection of 1000+ sand slides, accompanying bulk specimens, collections of colour transparencies and photographic prints to the Northamptonshire Natural History Society. His expertise in all fields ensured that all of his collections presented to these recipients were fully documented and outstanding both in the form of documentation and in the detail supplied to augment their scientific value.

Douglas was a leading figure in a number of local, county and national natural history and microscopy societies, founder of the Cross Hills Naturalists' Society microscope group and a long-standing member of the Craven Naturalists' and Scientific Association, which he joined in 1960. He was an active participant in and great supporter of the Postal Microscopical Society, with whose members he shared his slides and images, designed the postal box used by the society for over 20 years and he was awarded Honorary Life Membership in 1998. Douglas also had many associations with other microscopical societies around the country, such as Leeds and Manchester.

Always willing to help, Douglas assisted in many publications, both his own and with other associates, bringing his knowledge as an analytical chemist and using his skills to develop a method for testing for water hardness and pH. I first came across Douglas in the early 1970s, soon after he started work at Leeds University and just a few years after I started at the Leeds City Museum. With Paul Lee and others we were able to make many interesting invertebrate additions to the county. In recent years both Douglas and I became very interested in the work undertaken by teams from Malham Tarn Field Centre. His latest venture was investigating the natural history of Cowside, Darnbrook and Thoragill Becks at Arncliffe, which rejuvenated his interest in water analysis as well as aquatic invertebrate identification. His work was outstanding and he has left a rich legacy for others to follow.

Douglas leaves his wife Marion and two children, Barbara and Bernard. Whether it is nature or nurture we are not sure but those skills and enthusiasms seem to have passed down the generations. His four grandchildren have grown up to be a civil engineer, a biologist, a chemist and an acoustical engineer. We wait to see if his great-grandson, baby Matthew, grows up in a similar vein. Douglas died in his sleep on the morning of the 13th of December 2013 at Manorlands Hospice near Keighley, at the age of 94. His cremation took place on Monday 23rd December 2013 at Skipton Crematorium.

AN

YNU Excursions 2014

Circular No. 885

Divisional Secretary VC62: Mike Carroll, 10 Crofts Avenue, Pickering, YO18 7HP
Tel: 01751 476550; e-mail: Mickcarroll47@btinternet.com

The VC62 meeting will be to **Forge Valley near Scarborough on Saturday 17 May.**

Maps: 1:50,000 OS Map 101 (Scarborough, Bridlington & Filey)
1:25,000 Explorer OL27 (North York Moors, Eastern area)

Meeting place: Parking is limited within the valley but the meeting place for registration and health and safety information will be in the central car park at SE984871 at 10am.

There are three car parks in Forge Valley. Sieve Gate Gill car park is at the East Ayton end of Forge Valley (SE989858) with the remains of a limestone quarry on the right hand side. Going north up the valley the next car park is a fairly large one on the left at SE984871; the last, with the bird feeders, is also on the left at SE983874. There is a further car park round the corner on the low road into Raincliffe Woods at SE985876.

Indoor Meeting: West Ayton Village Hall will be open from 4pm for tea and cakes and reports from the sections. The hall is just off the A170 before the turn to Forge Valley on the left hand side. The contact for the Village Hall is Joy Tomlinson on 01723 862170.

The area: It is over 10 years since the YNU last visited the area and several changes have happened or are about to happen. Discussions are taking place to transfer day-to-day management of the adjoining Raincliffe Woods from Scarborough Borough Council to a local charitable trust. The main area of Forge Valley is now managed by Fallon Mahon and his team at Natural England, and they require more up to date information on the flora and fauna of the valley. It is over 60 years since the Scarborough Naturalists' Society published *The Natural History of the Scarborough District,* edited by G.B. Walsh & F.C. Rimington, and many alterations and additions to our knowledge of the area have been made since.

The western side of the River Derwent has had a wooden walkway running most of the length of the valley for many years but the West Ayton end has never had access to this walkway from the eastern side of the River. Some discussion has taken place about a bridge across the River at the weir opposite Sieve Gate Gill to access the walkway or that the walkway should be replaced or even removed, which would make the western side almost inaccessible due to the marshy nature of the area. The access paths into the forest from the northern bridge have had to be repaired and the wet woodland was drained to allow this work. Recent studies noted that this has had a drastic effect on the flora and fauna as well as the development of tufa in this very wet area.

Circular No. 886

Divisional Secretary VC63: Joyce Simmons, 16 Springfield Crescent, Kirk Smeaton, Pontefract, WF8 3LE. Tel: 01977 620725; e-mail: joyce@gentian.plus.com

The VC63 excursion will be to **Thorpe Marsh YWT Nature Reserve on Saturday 14 June.**

Maps: 1:50,000 Landranger sheet 111 (Sheffield & Doncaster)
1:25,000 Explorer sheet 279 (Doncaster)

Meeting Place: Meet at the entrance to the Thorpe Marsh Nature Reserve (SE595808) 10-10.30am. The gate is kept locked, so please be there before 10.30am (or inform me if you will be late). Most cars will be parked inside the locked gate and then some cars can be shared for the half-mile drive into the reserve for those who wish to travel to the centre (SE587096).

To reach the reserve, which is north of Doncaster, leave the M18 at J4, follow the A630 and turn right to Barnby Dun at the second roundabout. Keep straight on at the next roundabout and then follow Armthorpe Lane, staying right at the next two junctions and turn left at the third. Cross the River Don in Barnby Dun (left turn) and follow Fordstead Lane to the meeting place, a gate on the right after about a mile.

From Doncaster, proceed along the A19 into Bentley and take the second exit at the mini-roundabout after the shops, signposted Arksey and Barnby Dun. Go through Arksey towards Barnby Dun. Norwood Gate is on the left about a mile after Arksey.

Indoor Meeting: Meet at 'The Olive' Bar and Grill public house (SE618089), Barnby Dun at 4pm. Turn left from the reserve entrance and, after a mile or so, cross over the River Don and then a canal and turn immediately right. 'The Olive' is immediately opposite a T-junction after about 500yds. The conservatory is booked for our meeting. Tea, coffee, drinks and snacks are available and, as no charge has been made for the room, please do patronise them.

The area: Thorpe Marsh Nature Reserve (70 hectares) adjoins the site of the now defunct Thorpe Marsh Power Station. It is on the east bank of the River Don flood plain about three miles north of Doncaster.
History. The nature reserve was opened in 1980 and was managed by the Yorkshire Wildlife Trust supported by CEGB and its successor National Power until 1994. It is now run by YWT and nature reserve volunteers.
Habitats. A disused railway line crosses the site on an embankment which is clothed in mature trees, mainly oak, Silver Birch *Betula pendula* and Hawthorn *Crataegus monogyna*. Hides overlook the main water bodies and marshland. There are two artificial lakes and several smaller water bodies. Much of the reserve is unimproved and semi-unimproved

neutral grassland with a variety of vegetation. There are many mature trees and hedges on the site, with areas of scrub and wetlands. Plants include Pepper-saxifrage *Silaum silaus*, Great Burnet *Sanguisorba officinalis*, Common Figwort *Scrophularia nodosa* and Devil's-bit Scabious *Succisa pratensis*; many birds nest here, including Barn Owl *Tyto alba*, and there is an extensive lepidoptera list.
Hazards of the area: Steep steps, water bodies, boggy ground, rabbit holes.

Circular No. 887

Divisional Secretary VC64: Terry Whitaker, 4 Crowtrees, Low Bentham Via Lancaster LA27EE. Tel: 015242 62269; e-mail: t.whitaker1@btinternet.com

The VC64 meeting will be to **Austwick & Lawkland Moss SSSI on Saturday 12 July**.
The YNU Moth Group is invited to trap on the Friday night - generators/batteries will be required as there is no power source on site.

Maps: 1:50,000 Sheet 98 (Wensleydale & Wharfedale)
1.25,000 Explorer OL 41 (Forest of Bowland & Ribblesdale)

Meeting place: There is limited car parking near the site. Park on the disused A65 old road by the Harden Bridge (SD762678) and meet at 10:30am. We will try to run a car shuttle service to the site entrance.

Indoor reporting meeting: Dalesbridge Centre, Harden Bridge (SD762676) at 4pm; a small charge will be made for tea and biscuits.

The Area: Description: Austwick and Lawkland Mosses (SD7666) are two connected areas of peatland in the valley of the River Wenning, each much modified by past human activity and displaying, as a result, a wide range of habitats.

Austwick Moss is a raised mire on which peat cutting has reduced the depth of peat and in some places exposed the underlying shell marl. The resulting combination of acid bog and more calcareous hollows provides a mixture of ombrotrophic and poor fen communities in close proximity. Acidic pools and wet hollows are dominated by bog mosses *Sphagnum cuspidatum* and *S. recurvum*, with Cranberry *Vaccinium oxycoccus* and, more locally, Bog-rosemary *Andromeda polifolia*, Round-leaved Sundew *Drosera rotundifolia* and the bog moss *Sphagnum magellanicum*. The drier parts have Bog-myrtle *Myrica gale*, Purple Moor-grass *Molinia caerulea* and a Heather-Bilberry heathland. Birch carr gives way at the margin to poor fen, in which the effect of the underlying shell marl is evident in a richer community containing Marsh Cinquefoil *Comarum palustre*, Great Burnet and Northern Marsh-orchid *Dactylorhiza purpurella*. Unfortunately, drainage has encouraged the spread of birch, and this is a considerable problem. To the north and west of the Moss, there is an area of

calcareous flush vegetation containing Blunt-flowered Rush *Juncus subnodulosus*, Black Bog-rush *Schoenus nigricans* and Bird's-eye Primrose *Primula farinosa*. Lesser Butterfly-orchid *Platanthera bifolia*, Herb Paris *Paris quadrifolia*, Bog Orchid *Hammarbya paludosa* and Coralroot Orchid *Corallorhiza maculata* are also listed, but these have not been seen for many years. A similar but more varied range of habitats occurs further east on Lawkland Moss, including raised mire and birch woodland. Herb-rich grassland in the north and west of the site contains Saw-wort *Serratula tinctoria*, Betony *Stachys officinalis*, Adder's-tongue *Ophioglossum vulgatum*, Dyer's Greenweed *Genista tinctoria* and Meadow Saffron *Colchicum autumnale*. To the southeast are two large fields whose eastern halves are managed as meadows and are dominated by Sharp-flowered *Juncus acutiflorus* and Compact Rushes *J. conglomeratus* and Common *Carex nigra*, Star *C. echinata* and Brown Sedges *C. disticha* with an abundance of flowering plants such as Ragged-Robin *Lychnis flos-cuculi*, Marsh Valerian *Valeriana dioica* and Common Marsh-bedstraw *Galium palustre*, but which give way in their western halves to rough grazing land which is more acidic with Bog Myrtle, Common Cottongrass *Eriophorum angustifolium*, Bottle Sedge *Carex rostrata* and Creeping Willow *Salix repens*. The hemi-parasite Marsh Lousewort *Pedicularis palustris* and Common Cow-wheat *Melampyrum pratense* also occur here.

The mires are joined by a corridor of sedge-rich pastures valuable for breeding waders including Snipe *Gallinago gallinago*, Redshank *Tringa totanus*, Lapwing *Vanellus vanellus* and Reed Bunting *Emberiza schoeniclus*. The sites are an important locality for rare and local insects, including Small Pearl-bordered Fritillary *Boloria selene*, the recently discovered Silvery Arches moth *Polia trimaculosa* and the Marsh Oblique-barred *Hypenodes humidalis*. The small pools contain unique and rich assemblages of water beetles and other aquatic invertebrates such as the Water Spider *Argyroneta aquatica*.

Hazards of the area: These wet sites have a lot of very tussocky ground, so there is always risk from tripping and falling. There are several small ponds and moss pools which are deep and vertical-sided and it is also possible to fall into concealed holes in the bog, so do not work alone. Please take reasonable care at all times and wear appropriate clothing such as wellingtons. Deer are common on the site and consequently deer ticks are present. **Be aware of the dangers of Lyme Disease** which can be transmitted by tick bites. Any children in the party must be closely supervised by a parent or guardian at all times.

Previous YNU visits to the area, Circulars & Reports

Excursion 259, 16 June 1928, Circular 341, Separate; *The Naturalist* 53: 379-383.
Excursion 317, 13 May 1940, Circular 423, *Naturalist Suppl.*; *The Naturalist* 65:207-213.
Excursion 387, 5-7 June 1954, Circular 540, *Naturalist Suppl.*; *The Naturalist* 79: 153-154.
Excursion 480, 8 July 1972, Circular 670, Separate; *The Naturalist*, 97: 156-158.
Excursion 553, 30 May 1987, Circular 750,*YNU Bull*. 9: 24; *The Naturalist,* 113: 151-153.

Accommodation

Dalesbridge Centre. Austwick, North Yorkshire LA2 8AZ Tel. 015242 51021,

e-mail info@dalesbridge.co.uk
The Traddock Hotel. Austwick, North Yorkshire LA2 8BY Tel 015242 51224,
e-mail info@thetraddock.co.uk
Austwick Hall. Townhead Lane, Town Head, Austwick, North Yorkshire LA28BS Tel. 015242 51794, e-mail austwickhall@austwick.org
Wood View B & B. The Green, *Austwick,* LA2 8BB Tel. 015242 51190,
e-mail woodview@austwick.org
Yorkshire Dales Bunkhouse. Church Ave, Clapham, North Yorkshire LA2 8EQ, Tel. 015242 51144, e-mail info@claphambunk.com

Circular No. 888

Divisional Secretary VC65: Terry Whitaker, 4 Crowtrees, Low Bentham Via Lancaster LA27EE, Tel. 015242 62269, e-mail t.whitaker1@btinternet.com

The VC65 meeting will be to **Grinton, Harkerside Moor, Swaledale on Saturday 26 July.** The YNU Moth Group is invited to trap on the Friday night at Hudswell and Hag Woods, Richmond: meet at the NT car park (NZ157007). Generators/batteries will be required as there is no power source on site.

Maps: 1:50,000 Sheet 98 (Wensleydale & Wharfedale)
1.25,000 Explorer OL 30 (Yorkshire Dales, Northern & Central Areas)

Meeting place: Park alongside the minor road near Maiden Castle (SE019982) at 10:30am.

Indoor reporting meeting: (to be confirmed) 4pm at the Bridge Inn, Grinton (SE046984).

The Area: Description: The area is part of the southern slopes of the River Swale valley and also of the very extensive Lovely Seat-Stainton Moor SSSI. In the valley bottom are meadows and pastures while the vegetation is predominantly heathland on higher parts of the slopes, with Heather-Wavy Hair-grass community of variable species richness. In parts this dry heath forms a mosaic with the Heather-Common Cottongrass blanket mire into which it grades. Much of this is managed as Grouse Moor, which forms a mosaic of burnt-over areas in various stages of regrowth. Shooting has been carried on in Swaledale for 150 years and has its own impact on the upland landscape above 350m on Harkerside, where management has produced some of the broadest stretches of heather moorland of the dales. On the rockier, freely-drained slopes on the Lower Howgate Grits on Grinton, Harkerside and Whitaside Moors, Bilberry *Vaccinium myrtillus* increases in abundance and Cowberry *Vaccinium vitis-idaea* and Crowberry *Empetrum nigrum* occur. Heath Bedstraw *Galium saxatile*, Sheep's Fescue *Festuca ovina* and Wavy Hair-grass *Deschampsia flexuosa* also characterise the heath community. Adding to the mosaic on the edge of the heath-bog interface are areas of Heath Rush-Sheep's Fescue grassland and Mat-grass *Nardus stricta*-dominated swards occur on the extensive remains associated with ancient lead-mining

activities on Harkerside. Although in essence species-poor, they host such scarce metallophytes as Alpine Penny-cress *Noccaea caerulescens,* Moonwort *Botrychium lunaria* and Spring Sandwort *Minuartia verna*. Grinton How Mill (SE048964) is the best preserved smelt mill in the Yorkshire Dales National Park and well worth a visit. The area also has a few limestone outcrops and screes. Here Sheep's-fescue-Common Bent-Thyme communities dominate, containing plants such as Fairy Flax *Linum catharticum*, Flea Sedge *Carex pulicaris* and Ribwort Plantain *Plantago lanceolata* as well as the scarcer Limestone Bedstraw *Galium sterneri*, Blue Moor-grass *Sesleria caerulea* and Alpine Bistort *Persicaria vivipara*. Small but species-rich limestone flushes support Grass-of-Parnassus *Parnassia palustris* and the rare Bird's-eye Primrose.

Woodland and scrub are very restricted in the dale but Harkerside Moor is one of only three notable areas of W19 Juniper scrub within the Yorkshire Dales (**Re Juniper: please note the warning notice in the editorial)**. Immediately to the east is Horse Pasture Wood (SE007978), an area of 8ha comprising Alder-Ash and Oak-Downy Birch communities. Although surrounded by a fringe of Scots Pine *Pinus sylvestris*, the ground flora indicates ancient origins and there are at least 19 species of mosses and liverworts. Towards the eastern end of the site, around Grinton and Stainton Moors, more patches of Bracken *Pteridium aquilinum* occur on the heath. Bird records indicate a rich assemblage of moorland breeding birds, a nationally-significant Golden Plover *Pluvialis apricaria apricaria* population in excess of 200 pairs and a minimum of four pairs of Merlin *Falco columbarius*. Merlin and Short-eared Owl *Asio flammeus flammeus* favour taller heather for nesting while Red Grouse *Lagopus lagopus*, Golden Plover, Dunlin *Calidris alpina* and Curlew *Numenius arquata* take advantage of the varied structure provided by burning management. Snipe and Redshank breed around the grassy and marshy edges of the moor, while birds such as Ring Ouzel *Turdus torquatus* tend to occur around rock outcrops.

This is an ancient occupied landscape. At Maiden Castle (SE021980) a roughly circular 100m-diameter ditch 4-5m deep was carved out of the hillside in prehistoric times, with a long entrance in the form of an avenue of stones and with traces of hut circles inside. Its purpose is uncertain; possibilities include a defensive fort against the Romans or for use in rituals rather than a settlement. Iron Age defensive earthworks occur at Harkerside, Fremington Edge, How Hill, Low Whita and on the Grinton moraine (SE035986). The older drystone walls (mainly dating from the 16th and 17th centuries) enclose small, irregular fields near to the villages. The first parliamentary enclosures were on Fremington Edge in 1778. Higher ground was being enclosed by a series of straight, parallel walls by the 18th century. However, not all of the dale was enclosed, unlike Wharfedale and Wensleydale.

Hazards of the area: Steep and rocky areas and a lot of very tussocky ground, so there is always risk from tripping and falling. Please take reasonable care at all times and wear appropriate footwear and clothing. Any children in the party must be supervised by a parent or guardian at all times.

Previous YNU visits to the area, Circulars & Reports
Excursion 124, 4 June 1900, Reeth/Arkengarthdale Circular 153, *YNU Trans Suppl.*: 26.
Excursion 219, 22-24 May 1920, Reeth/Mid-Swaledale Circular 285, *Separate*: The *Naturalist* 45: 253-258.
Excursion 382, 22-25 May 1953, Grinton/Reeth/Mid-Swaledale Circular 531, *Naturalist Suppl.*: 78; *The Naturalist* 78: 173-175.

Accommodation
Arkleside Country Guest House, Reeth, North Yorkshire DL11 6SG Tel. 01748 884200, e-mail enquiries@arklesidereeth.co.uk
The Bridge Inn, Grinton, Richmond, North Yorkshire DL116HH Tel. 01748 884224, e-mail atkinbridge@btinternet.com
The Buck Hotel, Reeth, Richmond, North Yorkshire DL11 6SW Telephone: 01748 884 210, e-mail: buckhotel@btinternet.com
The Dales Bike Centre; http://www.dalesbikecentre.co.uk/ Tel. 01748 884908, e-mail enquiries@dalesbikecentre.co.uk
YHA Grinton Lodge, Grinton, Reeth, North Yorkshire DL11 6HS Tel. 0845 371 9636, e-mail grinton@yha.org.uk

Circular No. 889

Divisional Secretary VC61: Sarah White, Yonder Cottage, Ashford Hill, Thatcham, Berkshire, RG19 8AX. Tel: 01635 268442, e-mail: sarahpriest656@btinternet.com

The VC61 Meeting will be to **Skerne Wetlands on Saturday 9 August**.

Maps: 1:50,000 Landranger Sheet: 107 (Kingston upon Hull).
1:25,000 Explorer Sheet: 295 (Bridlington, Driffield and Hornsea).

Meeting place: Meet in the car park of the Skerne Wetlands YWT Nature Reserve (TA058543) at 10.30am. From Skerne village, take the minor road to Wansford and, just as you leave the village, turn right towards Church Farm. Follow the track towards Copper Hall and Cleaves Farm for about half a mile and turn right down the side of a shelter belt. At the south end of this wood, turn left through a gate. Cars may be left in the area by the gate (being careful not to block the track) or may be taken another few hundred yards along the track to the bridge where there is additional parking. There are no toilet facilities. The reserve is not yet open to visitors so there are no reserve signs from the village but the turning from the road will be marked with a temporary 'YNU' sign.

Dave Chesmore has kindly agreed to set up **a moth trap the evening before the Excursion,** so anyone wishing to see some of the moths should aim to **arrive by 9.30am.**

Tea and Meeting: In the WI Hall in Hutton Cranswick at 4.30pm. This is located on the north

side of the main street of Cranswick village, close to the junction with the lane to Hutton (TA022524, Postcode YO25 9QR). There is parking on the roadside. Maps showing the route from the reserve to the hall will be issued on the day.

The Area: Skerne Wetlands is a former commercial fish farm adjacent to the West Beck on the headwaters of the River Hull and comprises 60 ponds and a network of ditches interspersed with rough wet fen/grassland communities. It also includes a 2km length of the River Hull Headwaters SSSI, nationally important as the most northerly chalk stream system in Britain. The 33ha site was purchased in 2012 with grant aid from Natural England and part of a legacy to the YWT from Eva Crackles. The current plan is for YWT to restore the site to a mosaic of wetland habitats including wet grassland, wet woodland, reedbed, fen and pond habitat alongside the chalk stream of the West Beck.

This is a new Yorkshire Wildlife Trust Reserve, recently acquired and not yet open to visitors. We are being given the opportunity to visit in order to collect baseline data about the site before any major management work is started and to advise on optimising the site for wildlife. YWT secured funding from the WREN BAF landfill fund in June 2013, with the three-year funded project starting in October 2013. This grant will enable YWT to carry out the restoration and enhancement work across the site.

As a result of former commercial use, the landscape and vegetation have been subject to disturbance and enrichment and there was an abstraction of water from the river which temporarily depleted water levels. The site nevertheless supports extensive semi-natural wetland communities and is already a very valuable oasis for wildlife in this intensively farmed part of the East Riding. There are large areas of Common Reed *Phragmites australis* and Reed Sweet-grass *Glyceria maxima* alongside rough tall-herb communities of varying degrees of wetness. The West Beck, where it flows through the site, is fast-flowing calcareous water with shallows and gravel beds and the vegetation is dominated by Stream Water-crowfoot *Ranunculus penicillatus.* This is complemented by standing or slow-flowing water in the ditches and remaining stew ponds. There are species-rich wet fen and grassland communities close by at Kellythorpe Marsh between Driffield and Wansford and at Tophill Low, so there may well be relict plants and animals surviving here which will respond to sensitive management. Overall this site has enormous potential and it is important for the YNU to respond with records and advice to help the YWT make the most of its excellent initiative in purchasing this site.

Hazards of the Area: There is a good track which runs the length of the site offering access on foot or by car. However, great care needs to be taken in walking off the track as there are numerous old ponds and ditches with steep sides, some of which may be obscured by overgrown vegetation.

Reference: The citation for River Hull Headwaters SSSI is at: http://www.english-nature.org.uk/citation/citation_photo/1003424.pdf

Calendar 2014

Up-to-date information can also be found on the YNU website at www.ynu.org.uk/events/general

May	3	Bryology Section Field Meeting. VC64, Ingleborough. Meet in the old quarry at Storrs Common on the B6255 near Ingleton SD702733 at 10:00. (Note : if the weather is fine be prepared for an ascent to high ground on Ingleboro'.)
	6	Training Day - *Basic Field Skills* for Leeds Univ. students. Leeds Discovery Centre 9:30 Contact Roger Key if you are willing to tutor a small group.
	10	Conchological Section and Freshwater Ecology Section joint Meeting. Leeds and Liverpool canal, East Marton. Meet by village green SD908509 at 10:30.
	17	**VC62 Excursion** Forge Valley near Scarborough.
	17	Marine and Coastal Section Robin Hood's Bay NZ953048 – MBA Shore Thing Survey. Meet at 10:30.
	31	Botany Section Field Meeting VC61, Millington (Wolds). Meet on the roadside SE839530, 10:30.
	31	Freshwater Ecology Section Meet Ribblehead car park SD765792 at 10:30.
Jun	7	Botany Section Field Meeting VC64, Kippax. Meet in car park SE405295 at 10:30.
	14	**VC63 Excursion** Thorpe Marsh YWT Reserve.
	14,15	Marine and Coastal Section Runswick Bay NZ817155. Meet at 10:00.
	19-24	Swaledale Survey. Contact: AdrianXNorris@aol.com or Johna72newbould@yahoo.co.uk
	20	YNU Entomology Section at Hag Wood and Hudswell Wood nr Richmond. Meet at 10:00 at the Swaleview Caravan Park (NZ133012).
	29	Botany Section Field Meeting VC62, Kilburn. Meet in the small car park SE514805 at 10:30.
	29	YNU Entomology Section. Ox Close Wood, East Keswick. Meet at 10:30 at car park off the A659, East Keswick (SE362454).
Jul	12	**VC64 Excursion** Austwick and Lawkland Moss SSSI.
	13	Marine and Coastal Section South Landing Flamborough TA230692 – MBA Shore Thing Survey. Meet at 10:00.
	26	**VC65 Excursion** Grinton, based near the Scabba Wath Juniper scrub area.
	26	Botany Section Field Meeting VC63, Dunford Bridge. Meet in the TP Trail car park SE159023 at 10:30.
Aug	9	**VC61 Excursion** Skerne Wetlands .
	22	YNU Entomology Section. Inkle Moor & Bell's Pond, Thorne Moors. Meet at 10:30 at the junction of Goole Road with Moorends Road (SE692163).
Nov	15	**AGM, Malham Tarn Field Centre.** Transport from Settle & overnight accommodation available - see the next *Naturalist*.

YNU Entomology Section meetings - contact Bill Ely via billely@hotmail.com for further details.

Yorkshire Naturalists' Union

c/o NEYEDC, St William College, 5 College Street, York YO1 7JF
Tel: 01904 641631 Email: membership@ynu.org.uk
Website: www.ynu.org.uk
Registered Charity No. 224018

The Naturalist

Notice to contributors

Contributors should indicate whether they wish their manuscripts to be subjected to anonymous peer review. All other manuscripts will be reviewed by the Editorial Board who at their discretion may send them to third parties for comment and advice.

Original articles should be submitted electronically as an MS Word document to Dr A. Millard at a.millard@leedsmet.ac.uk.

Please look at a recent issue of the journal for a general idea of how to present your article. Also see *The Naturalist Guide to Consistency* on p77 of *The Naturalist* 1079 and please <u>**avoid**</u> the following:

- using any paragraph formatting and line spacings other than single.
- using tabs to tabulate information (please use MS Word table format or separate the column entries in a single row with commas and enter a paragraph mark at the end of the row).
- inserting any figures, graphs or plates into the text; indicate their proposed locations in the text and send as separate files.

Good quality, high resolution images are very welcome and should be sent as .jpg files, with a separate MS Word file containing the caption and name of the person to whom the image should be attributed.

If electronic submission is not possible, contributions should be sent to Dr. A. Millard, Woodland Villas, 86 Bachelor Lane, Horsforth, Leeds LS18 5NF (Tel. 0113 258 2482)

Contributors should ensure the accuracy of reference citations. The Editorial Board and Council accept no responsibility for opinions expressed by contributors.

Copy Dates:
April issue - **14 February**; August issue - **14 June**; December issue - **14 October**

ISSN 0028-0771

Yorkshire Naturalists' Union

MIX
Paper from responsible sources
FSC® C012290
FSC
www.fsc.org
DUFFIELD digital
Printed by Duffield Digital
www.duffieldprinters.co.uk

The Naturalist

ugust 2014
olume 139
umber 1086

Yorkshire Naturalists' Union

rnal of Natural History for the North of England

The Naturalist
Vol. 139 No. 1086 August 2014

Contents

An asterisk* indicates a peer-reviewed paper

Front cover: Adult Dark Green Fritillary *Argynnis aglaja*. See p112 and Plate III, centre pages. Photo: *J.Bowers*

Back cover: Ann Hanson of the Yorkshire Mammal Group demonstrates how to safely handle Longworth traps during a small mammals survey. See pp 82-101. Photo *J.Simmons*

Yorkshire Naturalists' Union

The Naturalist

August 2014 Volume 139 Number 1086

NU Notice

YNU Annual General Meeting

lotice is hereby given that the 152nd Annual General Meeting of the Yorkshire Naturalists' Union vill take place at Malham Tarn Field Centre on November 15 2014. The meeting will be receded by a meeting of the Natural Sciences Forum and followed by an address from the utgoing YNU President Dr Terry Whitaker with the title `From Yorkshire to China via Borneo'.

he full programme for the day is as follows:

10.30 Arrival. Tea and coffee
11.00 Short guided walk
11.30 - 12.45 Natural Sciences Forum
12.45 - 13.45 Buffet lunch
2.00 Formal welcome by the Craven Conservation Group followed by the AGM
3.00 - 4.00 Presidential address
4.30 Departure

he charge for the day will be £12.00, which includes lunch.
Aembers may book on-line at www. ynu.org.uk or with a cheque to the Events Organiser, Kerry letherway, 28 Westmorland Rise, Appleby, Cumbria CA16 6SJ (kerrynetherway@hotmail.co.uk).

minibus service will be provided from Settle Station price £10.00 return. Seats can be booked ia the events organiser. Accommodation for 1 or 2 nights is available at the Field Centre. Please ontact them directly: FSC Malham Tarn Field Centre, Settle, N Yorks BD24 9PU; Tel: 01729 30658.

Historical records of some mammals of the Whitby district and adjacent areas of Cleveland and the North York Moors

Colin A. Howes
email: colinhowes@blueyonder.co.uk

The following notes, collations of historical information and bibliography are presented as a background to monitoring historical trends in the mammal fauna of Whitby and adjacent areas of Cleveland and the North York Moors.

The first attempt to plot the distribution of this region's terrestrial mammals at a 10km scale was undertaken between 1965 and 1970 and published by Corbet (1971), followed by Arnold (1978) and updated in 1984 and 1993. The first project to collate local records at a 1km scale was undertaken by the Yorkshire Naturalists' Union, its members and affiliated societies through the 1970s and early 1980s, the results appearing in Howes (1983). This was updated and had the interpretative advantage of plastic overlays including river systems and altitude in Delany (1985). The project was updated by the Yorkshire Mammal Group (YMG) after a 20 year gap and with the benefit of digital mapping technology in Oxford *et al.* (2007).

INSECTIVORA

Hedgehog *Erinaceus europaeus*

A pioneer in the study of Hedgehog road casualties across the region was Ian Massey (1939-2008), late curator of Woodend Natural History Museum in Scarborough, who undertook a public participation survey gathering the dates and locations of Hedgehog road kills in the Scarborough district from 1966 to 1971. These included many records from across the North York Moors. His graphs illustrated the seasonality of Hedgehog winter hibernation versus summer activity periods and his locality records showed a strong urban correlation. Even in rural areas casualties were associated with villages and isolated farms (Massey, 1972).

From 1990 to 1993 the YNU organised a survey designed to compare Hedgehog population levels in the different geographical regions of Yorkshire using the mean number of road casualties per 100 miles on 20+ mile transects on A, B or C roads during sample survey months of July, August and September. 16 transects covering 522 miles across the North York Moors region encountered 28 Hedgehog casualties, giving a relatively low mean frequency index of 5.36 per 100 miles. Adjacent geographical regions recorded higher indices of 10.11 in the Vale of Pickering, 10.80 in the Vale of York/Mowbray and 12.58 on the Wolds. The most frequent associated habitat/land-use types were urban and grassland, each registering 34%, arable and woodland, each registering 12% and the lowest being open moorland registering 8% (Howes, 2002c).

Water Shrew *Neomys fodiens*

Live trapping by YMG caught two specimens of this seldom-encountered mammal in Cropton Forest in 1986 and three more at Rievaulx Terraces in 1987 (see Table 1). Capes (2002, 2013), also using Longworth live mammal traps, found it at Nunthorpe in 2002 and at Great Ayton in 2002 and 2003. Capes (2005, 2007, 2013) made significant strides in the study of the Water

Shrew in and around the North York Moors using the bait tube and scat analysis technique devised by Churchfield *et al.* (2000) in association with the Mammal Society National Water Shrew Survey, confirming its presence at Ingleby Greenhow, on the River Leven at Kildale and Stoup Beck at Fylingthorpe in 2004 and Mill Beck at Liverton, Easington Beck at Staithes, West Beck at Goathland and Danby Dale in 2005, where positive signs had been identified in the latter at the head of the dale during 1986.

Mole *Talpa europaea*

Preliminary studies suggest that Moles appear to favour deeper fertile soils of permanent pasture in the region. An investigation into the effect of soil type/land management on Mole occurrence in the Whitby and North York Moors region (Scalby Mills to Staithes and Thornton le Dale to Sleights) was carried out in April 1977. 245 pemanent pastures were sampled and 62% were occupied by Moles but only 8% of 140 arable fields were occupied. Interestingly, only 30% of grassland and 5% of arable fields that had been improved from moorland soils were colonised (Howes, unpublished). The use of calcareous hardcore in road construction has affected the soil chemistry of moorland road verges, enabling enhanced soil faunas including Moles to colonise grassy roadside verges across the otherwise acid podzolised soils of peatland, heather moors and coniferous forestry, which would otherwise have been unsuitable for them (pers. obs.).

One notable feature of the population, as revealed by local mole catchers, is the frequency of abnormally coloured specimens. These are usually some shade of yellow, ranging from almost white through cream and yellow to bright apricot; other variants are cinnamon, slate and smoke grey. It has been suggested (Massey, 1973) that Moles exhibiting recessive pelage colouration are less rigorously 'weeded out' than in surface-living mammals because of their relative freedom from avian predators. The majority of documented Yorkshire records are centred on the upper Esk Valley. Fifteen sandy/apricot-coloured specimens were trapped from January to April 1972 in Danby Dale and Westerdale. Similarly coloured specimens had been caught in Westerdale and Commondale during the 1920s and two cream-coloured animals were caught there and seven near Lealholme in 1936 (Massey, 1973; Howes, 1986).

CHIROPTERA

The Lesser Horseshoe Bat *Rhinolophus hippersideros* was thought to occur in the Newtondale area in the 19th century and was proved to occur around Helmsley Castle, Duncombe Park and the potholes known as the Windypits from 1921 to 1944. The discovery of droppings thought to be from this animal in the Windypits in 1983 possibly indicated its continued survival in the region (Howes, 1985a). Historically the Barbastelle Bat *Barbastella barbastellus* occurred in the Helmsley Castle/Duncombe Park area with confirmed records from 1919 to 1955 (Howes, 1985b). Currently nine species of bat are known to occur in the study area. Detailed studies of roosts and records of Common Pipistrelle *Pipistrellus pipistrellus,* Noctule *Nyctalus noctula* and Brown Long-eared Bat *Plecotus auritus* are provided for Cleveland south of the Tees (Wardhaugh, 1992, 1993 & 1994) but, with further fieldwork since the early 1990s, an improved knowledge of the UK bat fauna and the availability of more advanced ultrasonic bat detectors, Whiskered Bat *Myotis mystacinus,* Brandt's Bat *M. brandtii,* Daubenton's Bat *M. daubentonii,* Nattererer's Bat *M. nattereri,* Soprano Pipistrelle *P. pygmaeus* and Nathusius' Pipistrelle *P. nathusii* have been added to the local list, their Cleveland distribution shown in the tetrad distribution maps in Bond (2012).

LAGOMORPHA

Rabbit *Oryctolagus cuniculus*

Henderson (1997, 2003) shows that successive Ice Ages of the Pleistocene eradicated the Rabbit from Europe east of the Pyrenees, leaving the residual population confined to the Iberian peninsula. The Romans, recognising its value for meat, fur and sporting potential, re-introduced it to Italy where the practice of rabbit warrening was developed. By the Middle Ages rabbit warrening was being practiced in Spain, France and Germany and was exploited by the Normans, who brought the practice to Britain shortly after the Conquest.

It was established in the Yorkshire region by the early 1300s and, within a century, rabbit warrening in a range of forms was established across the county. Detailed studies and distribution maps of those on the North York Moors area are in Harris & Spratt (1991) and Henderson (2003). Medieval examples at Rievaulx, Medieval/post-Medieval examples at Broughton, Spaunton Moor, Levisham Moor and Nunnington and post-Medieval examples at Guisborough, Kildale, Ingleby Greenhow, Faceby, Scugdale, Bilsdale, Hutton-le-Hole, Lockton Warren, Staindale, Dalby, Dalby High Rigg, Ellerburn, Nabgate, Flainsey, Whitecliffe Rigg, Scambridge, Cockmoor Dykes, Hutton Buscel, Baker's Warren/Mt Misery and High Langdale End. All refer to tightly managed and guarded enclosed populations, though court proceedings record disputes from time to time between farmers and land-owners (warreners) over Common land being lost to warrening and crops being depleted by escaping Rabbits. The Black Death and the English Civil War would inevitably have enabled Rabbits to escape captivity, though it is likely that escapees would have been trapped out by the beleaguered human population. Curiously, there is no evidence of the long term establishment of feral populations until the 19th century, when warrening became marginal to the rural economy and game laws favoured the feral Rabbit, which soon assumed pest proportions (Henderson, 2003). The Rabbit became a major grazing competitor of the Brown Hare and the Water Vole, which had substantial terrestrial populations until that time. Rabbits were so abundant and ubiquitous that they became the preferred prey for predators, notably Red Fox and Stoat. However, the flea-borne disease *Myxomatosis* reached local Rabbit populations even in remote moorland valleys by 1954, exterminating the majority of the population. For a period grazing pressure was reduced, enabling hay meadows and grassy verges to bloom more spectacularly than in living memory. Stoats almost died out, Weasel numbers increased through reduced competition from the larger Stoat, and Red Fox diets diversified (Tapper, 1992).

Brown Hare *Lepus europaeus*

During the 1876-77 hunting season the Harriers at Whitby killed 23 Brown Hares in 34 days, giving a mean kill rate of 67 per 100 days hunting ('B.A.', 1877). The 6,000-acre shooting estate of Wilton was remarkable in Yorkshire for the numbers of Brown Hares it produced. Shooting bags of 150 were normal but five guns accounted for 247 Brown Hares on October 4 1905 and 255 on the following day (Bonnett, 1912). A Mr Wilson of Mayfield Place, Whitby, had two leverets "that were suckled by a cat and which used to follow him about and run in and out of the house like dogs" (Grabham, 1907). After *Myxomatosis* decimated Rabbit numbers in the 1950s, estate game registers showed that Brown Hare numbers temporarily rallied (Tapper, 1992).

RODENTIA

The invention of the Longworth live trap and the development of field methods and techniques associated with its use revolutionised small mammal studies, enabling specimens to be examined, marked, released back into the population and re-trapped. This opened the way to investigations of territoriality, home range, seasonal movement, dispersal, weight variation and a range of breeding cycle and demographic studies.

16 trapping sessions at 11 sites around the North York Moors region were undertaken from 1977 to 2007 by members of the YMG. This work collectively resulted in the trapping of 540 small mammals of seven species. An outline of the results is presented in Table 1 involving the following small mammals, their numbers and relative frequencies: Wood Mouse *Apodemus sylvaticus* 229 (42%), Bank Vole *Myodes glareolus* 168 (31%), Field Vole *Microtus agrestis* 14 (3%), Common Shrew *Sorex araneus* 120 (22%), Pygmy Shrew *Sorex minutus* 1 (0.2%) and Water Shrew 7 (1%), with other incidental catches including Weasel 1 (0.2%).

Table 1: Small Mammal Trapping by the Yorkshire Mammal Group in the North York Moors and adjacent areas.

Site/ OS Grid ref.	Date	No. of Traps	Wood Mouse	Bank Vole	Field Vole	Common Shrew	Pigmy Shrew	Water Shrew	Weasel	Source
Ashberry Pastures SE5685	Sep 1992	50	8							Oxford (1993)
Ashberry Pastures SE5685	Sep 1993		3			2				Hanson (1994)
Ashberry Pastures SE5685	Sep 1997	25	6	7						Hanson (1998a
Chafer Wood SE8993	Sep 1994		8	9		11				Hanson (1995)
Cropton Forest SE79	Oct 1986	100	11	14	8	41		2		Thompson (1987)
Dalby Forest SE8587	Aug 2007	50	20	7	1	5				Hanson (2007)
Ellerburn Bank SE8494	Oct 1977	96	75				1			Wooding (1977)
Garbutt Wood SE5083	Sep 1991	73	5	2	1	1			1	Oxford (1992)
Great Ayton NZ5711	Jun 2002	12	3	12	3	1		2		Capes (2002)
Great Ayton NZ5711	Aug 2002	12	6	18		2				Capes (2003)
Ingleby Greenhow NZ5704	Jul 2002	12	2	13		4				Capes (2003)

Site/ OS Grid ref.	Date	No. of Traps	Wood Mouse	Bank Vole	Field Vole	Common Shrew	Pigmy Shrew	Water Shrew	Weasel	Source
Mount Grace Priory SE4498	Jul 2005	50		6		1				Hanson (2005)
Mount Grace Priory SE4498	Jul 2003	50	40	20		25				Hanson (2003)
Rievaulx Terraces SE5784	Sep 1997	100	23	30		9				Hanson (1998b)
Rievaulx Terraces SE5784	Jul 1987	72	19	29		18		3		Thompson (1988)
Troutsdale SE9187; SE9288	Jun 2004	20		1	1					Mortimer (2004)

Red Squirrel *Sciurus vulgaris*

The Red Squirrel was once widespread across the region but in steep decline during the 19th century. Although squirrel pox and mange were implicated, mass starvation through widespread deforestation, particularly the removal of mature fruiting Scots Pines *Pinus sylvestris,* was probably a more realistic cause. A sudden immigration of Red Squirrels in the isolated plantations of the Fylingdales Moor area was thought to have resulted from heavy removal of timber from the Newton House woodlands and to the destruction of "some hundreds of acres of Scots Pine in the Sneaton Plantations in consequence of a ... tornado" (Barry, 1907).

Records published by the YNU from the 19th century and up to the First World War include Arncliffe Wood 1881, Langdale Rigg 1887, Kildale 1890, Kirkbymoorside 1893, Ingleby Greenhow 1899, Eskdale and Mulgrave Woods 1900, Wykeham 1901, Harwood Dale 1904, Loftus 1905 and Great Ayton 1913. One shot in the Whitby area In 1886 was sent to the taxidermist J.H. Wilson and a domestic cat suckled a nest of young (Red) squirrels at Bridge Farm, Staintondale, in 1898 (*Yorkshire Evening Post* 27 Apr. 1898).

After the establishment of the Forestry Commission in 1919 records were from Mulgrave Woods and the Helmsley area in 1923 but they had been seldom seen at Egton Bridge since 1914. Numbers temporarily rallied during the 1930s, possibly due to the development of the new Forestry Commission plantations. They were again being noticed at Egton Bridge in 1930 and had been seen at Osmotherley in 1931. Flintoff (1931) noted that "It is the general opinion... that the Red Squirrel is more numerous than it was a few years ago" in the Goathland area and Bramley (1933) noted a "welcome increase ... from the Whitby area" though cautioning that several had been found dead with disease. It is now known that the introduced Grey Squirrel, newly arrived in the Whitby region, is the vector of the squirrel pox virus for which the Red Squirrel has little resistance. One was killed on the road at Cloughton Plantation in 1939 and one was seen on Silpho Moor in 1940. The last records in the Whitby region seem to have been a small population noticed in Harwood Dale from 1942 to 1945 (Hazelwood, 1946) and one was seen at Kirkbymoorside during the YNU excursion in 1959. During the national squirrel survey of

1944-45 it was only reported to occur in 26 (18%) of surveyed parishes in the North Riding, none in the Whitby area (Shorten, 1946).

Grey Squirrel *Sciurus carolinensis*

36 animals from Woburn Abbey were released at Scampston Park in June 1906 (St Quintin, 1907) and a further 30 in October 1914 (Sheppard, 1915). Other releases which may have helped to form the basis of the current feral population across the North York Moors and the Cleveland Hills were at Bedale in 1913 and Darlington in 1914-15 (Middleton, 1931). By 1923 it was already "fairly common" around Helmsley (Booth, 1923) and established and "common" at Kingthorpe and Thornton Dale in 1930 (Flintoff, 1931). Early feral records close to Whitby were first noted by Mr A.S. Frank in Arncliffe Woods in 1925, where one was shot by the keeper a month or two later. and others were shot in 1930. Three were caught in a stoat trap in Egton Grange Woods in 1927. It was first seen in the woods in Glaisdale in 1930 and was already "common" at Golden Grove. James Patterson reported it from Wheeldale Lodge in 1930 and specimens were being shot in the woods around Newton House, to which the opinionated Flintoff (*l.c.*) noted that "it is spreading rapidly over this district in spite of efforts by game preservers to prevent it" and "that this 'wretched rat' should extend its activities in our direction is most regrettable."

Hazel Dormouse *Muscardinus avellana*

The following records from Howes (1984, 1985c & 2010) document the last known allusions to the Dormouse in the Whitby region from the 19th and 20th centuries before its evident local extinction in the 1970s. It was listed for the Cleveland area by J. Graves as early as 1808, though no specific dates or localities are given. At Pinchinthorpe one was found by R. Lofthouse in the spring of 1881. Thomas Nelson regarded it as "not numerous" in the Redcar area and G. Page described it as being "rather scarce" near Guisborough. A specimen captured some years before 1884 at Loftus was examined by J. Carter. G. Abbey watched one emerging from its nest at Grinkle Park, his only sighting of one during a lifetime in this locality. In 1877 the naturalist 'B.A.' saw a locally caught specimen in the workshop of a Whitby taxidermist [possibly John H. Wilson of Baxtergate (Marshall, 2007)]. T. Stephenson did not consider the Dormouse to be a common animal in the Whitby area during the 1880s, though W. Lister and J. Braim reported that "a few are found at Glaisdale". Specimens in Whitby Museum, mentioned in the literature in 1884 and 1907, were said to be from nearby Mulgrave Woods.

On July 9 1909 the gamekeeper James Patterson took Mr Oxley Grabham, then Curator of the Yorkshire Museum in York, to a small wood surrounded by grouse moorland near Goathland where he knew that three or four pairs of Hazel Dormice bred annually. Though the site's name was never revealed it is likely to have been one of the woods along the West Beck, possibly the isolated Hazel Head Wood on the south-facing escarpment near the shooting box upstream of Nelly Ayre Foss. A nest containing six half-grown young was located, on which Grabham (1909) based his celebrated series of photographic studies. In 1910 the colony was said to be steadily increasing, a claim presumably based on a visit to the site, when Patterson showed Grabham and E.W. Taylor (Chairman of the YNU Vertebrates Section) a nest containing three half-grown young. Grabham and Taylor again found an occupied nest in the same part of the plantation in 1911, though at a later date (pre-1956) Taylor, accompanied by Mr Adam Gordon (gamekeeper at Duncombe Park), failed to re-find a specimen. Brown (1980), ecologist with the North York

Moors National Park Authority, identified tracks in the Esk Valley in 1978 and in 1979 in the same area he claimed at least one sighting and the finding of a mandible of a Hazel Dormouse in a Barn Owl *Tyto alba* pellet.

Figure 1: Historical records of Hazel Dormouse showing the locations of occurrences from the 19th century to 1979 across the study region. Symbols: Triangle = 19th century, Open circle = 1900 to 1910, Solid dot 1978 and 1979 (based on Howes, 2010).

Whilst searching for field evidence of Hazel Dormice in the form of characteristically chewed hazel nut shells, in 1993, the author and members of the YMG visited six woodland sites within the study area, each with a good Hazel *Corylus avellana* understorey. After 4½ hours of searching 887 fallen Hazel nut shells were found. 776 had been opened by vertebrates, 762 (98%) by Squirrels and 14 (2%) by Bank Voles but none by Hazel Dormice (Howes, 2010).

Water Vole *Arvicola amphibius*

Pioneering work on the ecology, predation and status monitoring of the Water Vole was undertaken in the North York Moors region during the 1980s (Woodroffe, 1988; Woodroffe *et al.* 1990a, 1990b). This influential work directed early attention to the collapse of the animal's status and highlighted the role played by excessive predation of riparian populations by the feral American Mink. The survey methodology of quantifying Water Vole burrows, lawns and latrines formed the basis of a veritable industry in the production of parochial, river catchment and national Water Vole surveys.

An examination of the mitochondrial DNA of Water Vole tissue samples in museums from round the UK showed that the post-glacial re-colonisation of the United Kingdom had been undertaken by pioneers from two distinct phylogenetic groups or clades. These have formed two geographical distributions, a Scottish clade which seems to have originated in the Iberian peninsula and an English/Welsh clade which seems to have originated in eastern Europe (Piertney *et al,* 2005). To refine the geographical boundary between the two groups, the Environment Agency examined Water Vole droppings collected in a wide range of sites in 2008, including some from the North York Moors and Cleveland region. These proved to belong to the Scottish clade (Bond, 2012) whereas material in the 2005 study from Scarborough belonged to the English/Welsh clade indicating that the Whitby district is on the boundary between the two main UK phylogenetic populations.

CARNIVORA

Early documentary records of bounties paid for certain mammals, mainly Carnivora, have been obtained for seven local townships and parishes, mainly in the form of churchwardens' accounts held at the North Yorkshire County Record Office (NYCRO) in Northallerton. These include records of Polecat *Mustela putorius* from 1724, Stoat from 1748, Weasel from 1776, Badger from 1797, Otter from 1745 and Red Fox from 1672. Details of numbers, locations and sources are presented in Table 2. Parishes elsewhere contain records of Hedgehog and Mole. Further archival searches may reveal such records for the Whitby district.

Table 2: Carnivore bounty records from Parishes in the North York Moors and adjacent areas (from Lovegrove, 2007, Howes, 2009). Figures in square brackets indicate relative frequency on a scale of 1 (very infrequent) to 5 (very numerous) (Lovegrove, 2007).

Parish/ Township	Sources & NYCRO archive codes	Archive Date Range	Polecat	Stoat	Weasel	Badger	Otter	Fox	Total
Brompton-by-Sawdon	PR/BRO Mic. 1084	1748-1851	149	6		2	1	2	159
Fylingdales	PR/FY Mic. 1338-41 (Lovegrove, 2007)	1762-1833				[1]		[1]	
Great Ayton	PR/AYG Mic. 1202	1734-1815	224		2		4	45	275
Helmsley	PR/HEL Mic. 995	1671-1785	1					619	620
Hilton	PR/HIL Mic. 1205; 09	1761-1858	18					5	23
Lastingham	PR/LAS Mic. 1976; 85. (Lovegrove, 2007)	1693-1894				[1]		[1]	
Lythe	PR/LY Mic. 1396. (Lovegrove, 2007)	1704-1840			[1]			[3]	
Scarborough	Clarke (1892)	1774-1776	37		1				38
Stainton-in-Cleveland	PR/STC Mic. 1205; 07-08	1769-1848	306					5	311
Totals			**735**	**6**	**3**	**2**	**5**	**676**	**1,427**
%			**51.6**	**0.4**	**0.2**	**0.1**	**0.3**	**47.4**	**100**

Red Fox *Vulpes vulpes*

The earliest evidence of the Red Fox in the region, earlier even than from churchwardens' accounts, is from the histories of the local fox hunts. For the Staintondale Hunt there is a tradition that George Villiers, the second Duke of Buckingham, hunted both Red Fox and Red Deer here in the 13th century by royal warrant. Tradition tells of the Buckingham Stone near 'Chop Yat' on the North York Moors marking where the Duke's horse collapsed and died after a severe three hour pursuit of a Fox. It is also claimed that Red Foxes have been hunted on the Sinnington Hunt territory since the 13th century and that organised fox hunting has operated here since 1680. Allusions to 10 packs of foxhounds have been traced in the Whitby, Cleveland

and North York Moors area, each operating within its own defined territory. A brief account of their histories and descriptions of their hunting territories is in Howes (2009).

It was to the prowess of hunt masters and the reputation of the hunts to provide exhilarating riding country and the prospect of finding good numbers of healthy Red Foxes capable of producing good 'runs'. The extensive hunting literature provides transcriptions from hunt diaries of former masters describing celebrated runs. Fox 'find' sites recorded by masters of the Cleveland Hunt from 1838 to 1871 (Pease, 1887) have been traced on 19th century Ordnance Survey sheets to generate Figure 2, which provides an impression of local Red Fox distribution in the mid to late 19th century.

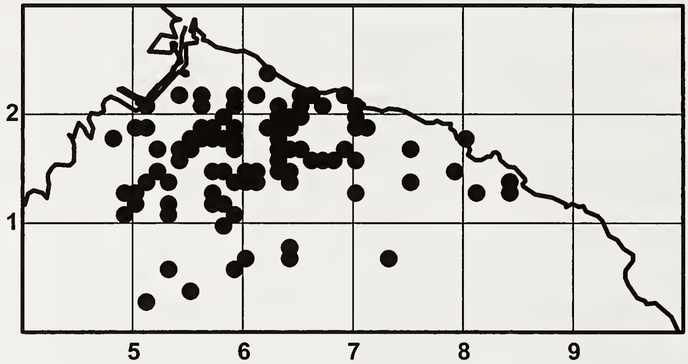


Figure 2: Locations of Red Fox 'find' sites recorded by the Cleveland Hunt from 1838 to 1871 (data from Pease, 1887).

Since the annual numbers of Red Foxes killed by hunts are likely, to some extent, to be a function of hunting effort (numbers of days in the field), data provided by Pease (*l.c.*) have been used to show the mean number of Red Foxes killed per standard 100 days from 1838 to 1871 (see Figure 3).

This set of calculations shows considerable annual fluctuation but indicates a general decline from a peak of 96 kills per 100 days hunting in 1841 to a nadir of 22 in 1864, followed by recovery to 75 in 1868. Within this pattern are several steep declines as in 1844, 1851 and 1856. Similar sudden declines in other Yorkshire hunts have coincided with reports of debilitating outbreaks of mange. This may indeed have been the case in the Cleveland region, since Blakeborough & Pease (1914) refer back to "the great mange scourge" and that "Badgers, thought to be immune or un-susceptible to mange, were introduced into fox hunting territories to clean mangy earths".

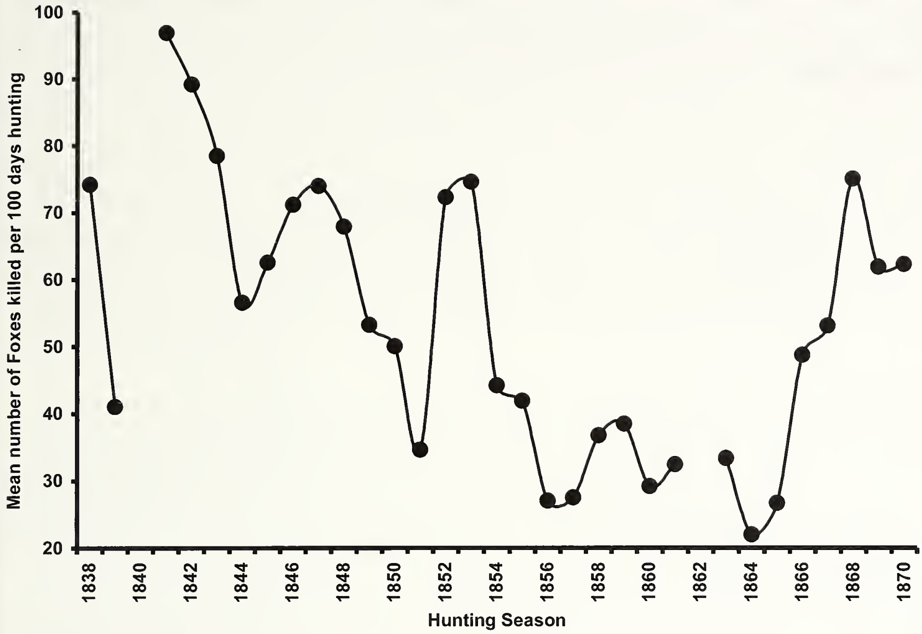


Figure 3: Fluctuations in the annual numbers of Red Foxes killed per 100 days hunting by the Cleveland Hunt during hunting seasons 1838/39 to 1870/71 (figures calculated from hunt diary entries in Pease, 1887).

Badger *Meles meles*

There is an extensive historical literature on the Badgers of the Whitby region commencing with a field sports perspective in Blakeborough & Pease (*l.c.*). During the 19th and early 20th centuries Badger persecution was rife in north-east Yorkshire and the Cleveland area (Howes, 1988). Blakeborough & Pease (*l.c.*) provide an eye witness account of a successful badger dig in the Pickering area, the final extraction of the Badgers into sacks for later baiting being achieved by the use of metal pincer-like 'badger tongs' known locally as 'clams'. Badger tongs are rare or unrecognised in museum social history collections, though a set collected in the winter of 1985/86 from Thornton Dale is in the Rydale Folk Museum, Hutton-le-Hole. Blakeborough & Pease (*l.c.)* note that Kirkbymoorside was a "locality in which badgers abound and in which baiting was popular". The hunting literature shows that Badgers were hunted with fox hounds in woodland around Kirkbymoorside, Duncombe Park, Boltby, Bilsdale and Farndale in the 1860s. However, opinions varied amongst the fox hunting fraternity as to the merits and de-merits of Badgers. Some regarded them as a potential threat to Red Fox cubs and a nuisance for opening up stopped earths in advance of a hunt. Others recognised their value in creating and cleaning out earths. Although Badgers had been exterminated from many estates during the 19th century, Blakeborough & Pease (*l.c.*) recognised their benign and beneficial nature in fox hunting territory and championed their preservation and re-introduction, contrary to the prevailing attitudes. Badgers were regularly killed in the interests of game rearing and stock protection by laying poisoned baits or by gassing setts, particularly since the 1950s. M. Johnson of the Forestry Commission found 7 setts in the Wykeham Forest area inactive due to gassing in 1962.

Knight, Middleton & Paget (1972) reported on the 125 setts which John Knight and others had located in the northeastern (Cleveland, Whitby and coastal) part of the North Riding as part of the Mammal Society National Badger Survey . Findings are reviewed in Table 3.

Table 3: Associated habitats, soil types, site incline and activity level at Badger setts (Knight, Middleton & Paget, 1972).

Habitat	**No. of setts**	**%**
Deciduous Woodland	27	21.6
Coniferous Woodland	58	46.4
Mixed Woodland	24	19.2
Copse	7	5.6
Hedgerow	3	2.4
Open Field	4	3.2
Quarry	1	0.8
Others	1	0.8

Soil Type (Only recorded in 96 setts)	**No. of setts**	**%**
Sand	66	69.0
Clay	15	15.5
Limestone	7	7.2
Shale	8	8.3

Incline	**No. of setts**	**%**
Slope	124	99.2
Level	1	0.8

Activity (Only certain in 107 setts)	**No. of setts**	**%**
Active	86	80.4
Non-active (including extinct)	21	19.6

Sixty years after the beleaguered status of local Badgers was described by Blakeborough & Pease (*l.c.*) the topography and habitats of the comparatively numerous Badger setts in the North York Moors region were beautifully described by Paget & Middleton (1974). Currently the North Riding Badger Group undertakes the role of monitoring these setts and recording local Badger road casualties.

European Otter *Lutra lutra*
Historical records in *The Naturalist* from the River Esk catchment show that an Otter trapped a few days previously was turned down and killed after a short hunt at Lealholme Bridge in 1894 and a young female was killed at White Hall shipyard also in 1894, the preserved specimen being exhibited at Whitby Museum. A female was killed at Glaisdale in 1896 (*Whitby Gazette* 24th Jan. 1896) while a male was killed at Egton Bridge and a male and a female were killed at Grosmont in 1897. One was seen near Sleights Bridge and three were seen at Ruswarp Weir in 1898. One was shot at Ruswarp Weir in 1900 and Otters were regarded as “abundant” in the Esk at Castleton in 1911. They were “not uncommon” at Egton Bridge in 1925 and 1930, while tracks were seen in the snow on the frozen Esk in 1941. *The Northern Echo* of 20 Dec. 1940 gave a lurid

account of a fight between a large, allegedly male, Otter and a seal in the Esk above the dam at Ruswarp. Footprints were seen at Lockwood Reservoir in 1952 and Otters, previously recorded at Lownorth Beck and Jugger Howe Beck on the upper Derwent catchment in 1904, were at Littlebeck in 1972, Ramsdale Beck at Fylingdales in 1976 and Beck Hole on the Murk Esk in 1978.

Woodroffe's (1994) meticulous examination of the records of the Northern Counties Otter Hounds, which regularly worked the Esk and its tributaries, showed that 16 days of hunting from 1933 to 1939 accounted for 15 Otters (0.93 per day) and that 11 days of hunting from 1950 to 1959 produced 12 Otters (1.09 per day). These figures are significant since they provide an index of the Otter population on the Esk immediately prior to the organochlorine pesticide-induced Otter crash of the 1960s.

The series of national otter surveys, which each sampled a standard 25 stretches of the Esk catchment, encountered positive signs at just one site in 1986-88, three in 1991-94, 20 in 2000-02 and 21 in 2009-2010. The Vincent Wildlife Trust introduced four Otters into the area between 1990 and 1993 (Jefferies *et al*, 2000) and the large increase in positive sightings noted in the 2000-02 survey is probably due to these releases (Crawford, 2005).

The annual mammal reports of the Whitby Naturalists' Club noted that Otters were back on the Derwent/Esk catchment in 1994 and there have been many reports since (see Fig. 4).

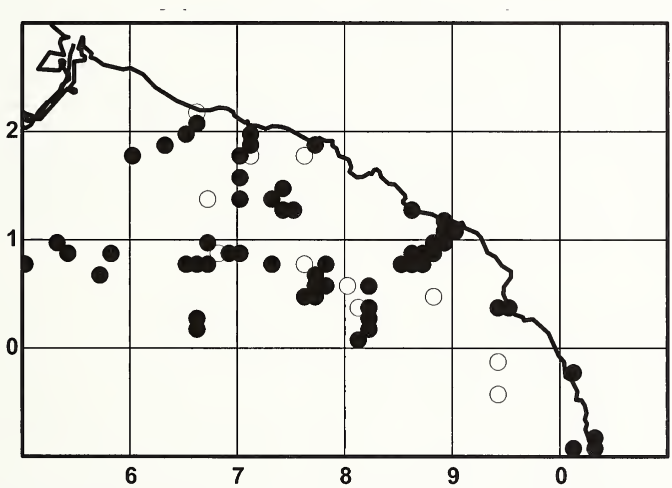


Figure 4: Approximate locations of Otter records from the River Esk catchment and minor becks opening onto the shore and adjacent coastal habitats from Saltburn to Scalby Mills.
Open circles = 1790-1979. Solid dots = post 1980.

Historical records from the Cleveland coast show that Otters were present in the beck at Saltburn in 1790, in Roxby Beck at Staithes in 1896, at Liverton Mines in 1904, at Loftus in 1905 and in the Waitel Beck in 1905. During 1997 and 1998 Winter (2002) made investigations of Otters' use of the minor becks opening onto the shore and adjacent coastal habitats at sites from Saltburn to Scarborough. Otters were known to frequent the lower reaches of Scalby Beck which emerges onto the rocky shore at Scalby Mills and Otters on the Esk were known to visit Whitby Harbour. Spraint was located above Mean High Water mark on the boulder-strewn

shores at Scalby Ness and Hayburn Wyke in 1989, the Scalby Ness samples containing fish bones and the carapaces of small crabs. Signs were identified by the stream emerging onto the sandy shore at Sandsend in 1997 and at Stoup Beck, which emerges onto the shore of Robin Hood's Bay, in 1998. The only other positive coastal site was at Saltburn-by-the-Sea where Saltburn Gill and Skelton Beck merge before emptying onto the cobble beach.

Stoat *Mustela erminea*

In 1930 and 1934 John R. Flintoff (1873-1941) of 'Water Ark', Goathland, undertook a questionnaire survey of gamekeepers and estate managers, requesting the numbers, sexes and pelage forms of Stoats trapped on shooting estates. Replies were readily provided from 51 estates across Yorkshire and into adjacent counties, including 20 from the North York Moors and adjacent areas on the northern edge of the Vale of Pickering. Flintoff's pioneering survey provided an invaluable legacy of raw data, anecdotes and a preliminary interpretation on the subject of winter whitening (ermine pelage) (Flintoff, 1933, 1935 & 1936). These have enabled levels of occurrence of ermine pelage to be compared at different altitudes and in different geographical regions across Yorkshire and adjacent counties (Howes, 2002b).

Not all UK Stoat populations have the gene which gives rise to the winter whitening process. This tends to be absent in the southeast of Britain and present in the northwest (McDonald & Harris, 1998). With 'Watsonian' Yorkshire being on the boundary of these two zones, Flintoff's survey provided revealing data on the geography of the winter whitening phenomenon in the UK. 197 (7.6%) of the 2,584 stoats killed on estates in the Whitby and North York Moors region exhibited some degree of winter whitening. This compared with 15.3% for adjacent counties to the north of Yorkshire, 10.5% for the Yorkshire Dales, 5.1% for the Wolds and Holdernss, 5% for the southern Pennines, 3.4% for the Vale of York and 3.5% for adjacent counties to the south. With chill air temperatures suppressing the production of melanin in the autumn moult, a re-working of Flintoff's data showed that Stoats from shooting estates with land above 1000ft exhibited a greater incidence of ermine pelage (Howes, 2000b).

20 local estates and correspondents provided records to Flintoff's survey. Their locations provide in Figure 5 an impression of local Stoat distribution from 1931-34.

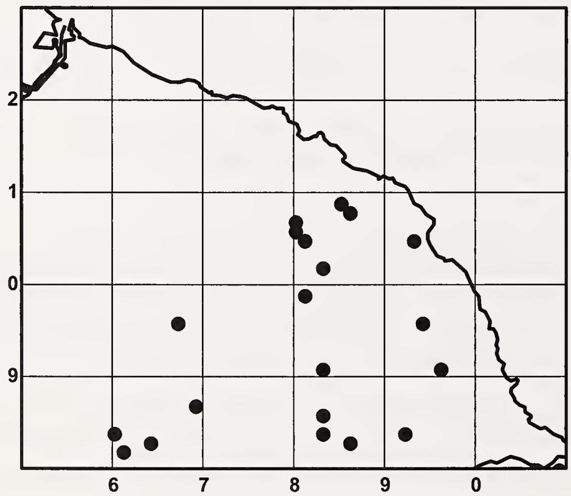


Figure 5: Locations of shooting estates on the North York Moors and the northern edge of the Vale of Pickering from where Flintoff received statistics of 2,584 Stoats killed 1931-34 (from Flintoff, 1933, 1935 & 1936).

American Mink *Neovison vison*

This versatile riparian predator which feeds on a wide range of waterside and aquatic vertebrate and crustacean prey was first imported into Britain from Canada and Alaska in 1929 to be farmed for fur. Yalden (1999) ascribes the origins of this commercial episode to surviving military officers returning from the First World War investing their pensions in the new industry of fur farming. The close association between British and Canadian forces for training and joint combat purposes no doubt provided the necessary contacts and inspiration for subsequent peacetime commercial ventures. The industry expanded considerably after the Second World War and by 1962 the number of mink keepers in the UK had peaked at around 700 with 79 established in Yorkshire, at least 7 in and adjacent to the North York Moors region (see Table 4). On January 1 2003, the Fur Farming (Prohibition) Act 2000 (Commencement) Order 2001 came into effect, after which it was illegal to keep animals in England and Wales solely or primarily for slaughter for the value of their fur.

Table 4: Evidence of mink farms in or adjacent to Whitby and the North York Moors region (from Howes 2009).

Locality	Grid ref.	Date	Stock
Eskdale, Sleights	NZ8608	1973	11 ♂ & 53 ♀
Alma Fur Farm, Pickhill, Thirsk.	SE3483	1973	60 ♂ & 240 ♀
Bondgate, Helmsley.	SE6183	pre-1970	4 ♂ & 15 ♀
Pottergate, Helmsley	SE6183	1960	
Wood Cottage, Brompton-by-Sawdon.	SE9482	pre-1968	50 breeding Mink
Hilton Mink Farm, Hilton.	NZ4611	1960	c.250 ♂ & 960 ♂ in 1962
Yarm	NZ41	1960	

Land-owners and estate workers were generally oblivious to the presence of American Mink on their land, even in riparian situations, but following awareness training provided by ADAS staff and experimental trapping sessions associated with the newly launched MAFF bounty scheme, American Mink were regularly encountered and reported. This trapping-based eradication scheme was instigated in 1965 but abandoned in 1970, when it was accepted that Mink were too well established and widely distributed for eradication by this means. Riparian landowners and occupiers have been encouraged since 1970 to undertake trapping where necessary to protect vulnerable stock (poultry, ornamental wildfowl and fish). The first records on river systems in the Whitby region, though not necessarily of established populations, were from the Esk catchment where their spread was rapid. First noticed in Westerdale in 1965, individuals had reached Ruswarp, in excess of 16 miles downstream, by 1967. They were in the Rye catchment at least by 1967 and the Upper Derwent catchment by 1968. Recently they have been photographed successfully hunting fish in coastal rock pools at Whitby and Saltwick Nab. It is likely that in future they will meet with intra-guild competition from re-colonising Otter populations across the region.

Wildcat *Felis silvestris*

A rock shelter site identified as "possibly ... a wildcat den" at Pifflehead Wood in Newtondale was excavated by Simms (1972) and contained the bones of a small Beaver *Castor fiber* amongst other prey remains. The earliest positively-dated Wildcat evidence is a single bone from an early Iron Age village site dated 2,500-2,400 b.p. on Castle Hill, Scarborough (Rutter, 1956). What is regarded as the last record of Wildcat in Yorkshire was one trapped by Mr John Harrison on his farm at Murton near Hawnby one winter around 1840 (Howes, 2002a).

ARTIODACTYLA

Roe Deer *Capreolus capreolus*

Evidence from a range of Yorkshire cave and fissure sites shows that Roe Deer formed part of the early post-glacial (Flandrian) fauna of the North Yorkshire region, indeed at the Mesolithic hunting camp at Star Carr in the eastern Vale of Pickering, dated at 9,500 years b.p., Roe Deer were the second most frequent quarry, being outnumbered only by Red Deer. Roe Deer were evidently common in the medieval landscape. They were hunted, or harvested, in the Forest of Pickering, where £5 was paid for cord to make nets to catch Roe Deer in 1322 (Mitchell, 1985). Roe venison featured in the banquet at the archiepiscopal palace at Cawood to celebrate the enthronement of George Neville as Archbishop of York and Chancellor of England in 1466 (Clarke & Roebuck, 1881).

After an absence of documentary records or, indeed, evidence of any description for about four centuries, Roe Deer again appeared in the North Yorkshire region in the 20th century. The formation of the Forestry Commission in 1919 quickly gave rise to the establishment of extensive areas of softwood plantations, largely in the North York Moors/Cleveland uplands and mainly in the region of what is now the North York Moors National Park. By the 1930s these early forest blocks were reaching the 'thicket' stage of development, a habitat stage known to be highly attractive to Roe Deer colonisation. The first modern encounters with Roe Deer took place in the Dalby Forest in 1936 and populations were present throughout the Forestry Commission and Duchy of Lancaster Forests in the north-east Yorkshire/Cleveland uplands within a decade (Simpson, 1969).

Whether these deer originated from an un-noticed residual north-east Yorkshire population or had moved down from the Durham/Northumbrian region is difficult to establish. However, the North Yorkshire population expanded markedly during the 1940s, 50s and 60s, with visitors to the National Park routinely enjoying encounters with groups of deer crossing rides or public highways. Sadly, the combination of an increased deer population and a greatly increased volume of traffic movements has given rise to road traffic accidents at a rate of over 100 per year in the North York Moors/Cleveland region (Gordon Simpson, pers. comm.).

Red Deer *Cervus elaphus*

Red Deer were a prime quarry in the Forest of Pickering. Incidents of poaching regularly featured in the Forest Assize records of the 14th century, Rimington (1956) noting that seven men were caught taking a stag at Ellerbeck with bows, arrows and greyhounds in 1307. An enquiry into the state of the forest in 1503 claimed that 200-300 Red Deer were present. The examiners and eight helpers then entered the woods and within two hours encountered 140-160 animals. Another survey of the mid-16th century showed evidence of 263 Red Deer

including 54 stags. By 1608 the number appears to have fallen to 15 or 16 stags and a survey of 1619-21 records that there were few Red Deer left, confined to Newtondale and woodland at Hackness (Rimington, *l.c.*).

Following the escape of the 350-strong herd from Duncombe Park at Helmsley during the Second Word War, sightings were reported widely throughout the Hambleton and Cleveland Hills and in the Forestry Commission plantations north of the Vale of Pickering. Two stags were seen in the Dalby Forest in 1946, Red Deer were present in the Wass Woods area in 1947 and there were reports from woods between Ampleforth and Rievaulx in 1951 and from the Helmsley area in 1953. A feral population had become established in the conifer forests north of Allerston, where breeding was proved in 1950, and in 1969 Red Deer were present along the Hambleton escarpment (Howes, 1984).

Table 5: Deer Parks which may have provided the basis of past or present populations of feral deer in the Whitby, Cleveland and North York Moors region (from Howes 1984)

DEER PARK	Earliest date traced	Historical maps and deer species reported
Blansby Park	fl.1547	**Saxton's map 1577; Speed's map 1610; Shirley (1867)** Fallow
Crayke Park	fl.1530s	**Leland 1530s-40s; Shirley (1867)** Fallow
Duncombe Park	fl.1517	**Saxton's map 1577; Speed's map 1610; Shirley (1867)** 600 Fallow in 1717; **Whitaker (1892)** 320 Fallow, 300 Red; **Victoria County History (1912)** 350 Fallow, 350 Red; **Whitehead (1950)** Fallow
Gilling Park	Emparked 1374	**Shirley (1867)** Fallow
Helmsley Park	fl.1577	**Saxton's map 1577; Speed's map 1610; Shirley (1867)** Fallow
Kirkbymoorside Park	fl.1577	**Saxton's map 1577; Speed's map 1610; Shirley (1867)** Fallow
Mulgrave Park	fl.1577	**Saxton's map 1577; Speed's map 1610; Shirley (1867)** Fallow; **Whitaker (1892)** 30 Fallow; **Victoria County History (1912)** 30 Fallow
Newborough Park	Emparked 1382	**Shirley (1867)** Fallow +
Scampston Park	fl.1892	**Whitaker (1892)** 100 Fallow; **Whitehead (1950)** Fallow
Sinnington Park	fl.1577	**Saxton's map 1577; Speed's map 1610; Shirley (1867)** Fallow
Thornton Park	fl.1577	**Saxton's map 1577; Speed's map 1610**
Whorlton Park	fl1577	**Saxton's map 1577; Speed's map 1610; Shirley (1867)** Fallow
Key	fl.	Flourishing = deer park in operation
	+	Park extant at time of writing (Shirley 1867)

Chinese Muntjac *Muntiacus reevesi*

Introduced into the animal collections at Woburn Abbey, Bedfordshire, around 1900, specimens escaped into the adjacent countryside and established a feral population during the 1920s. It expanded its range naturally to adjacent counties, arriving in Derbyshire by the 1970s and South Yorkshire by 1992. Its early occurrences in the Yorkshire region were reported simultaneously from widely discontinuous sites from the Doncaster, Rotherham, Wetherby, Calverley and

Bingley regions, raising suspicions that these easily trapped deer were being caught and translocated by shooting interests to woodland shoots around the county (Howes, 1993). In north-east Yorkshire it was first noticed in the Middlesbrough area in 1999 and Bond (*l.c.*) reported sightings from Errington Wood in 2008 and Wiley Cat Wood in 2011.

Fallow Deer *Dama dama*
Table 5 shows that Fallow Deer were kept in all 12 of the local deer parks with up to 600 present at Duncombe Park in 1717 (Shirley, 1867). The Duncombe Park herd escaped into the adjacent woodlands and new Forestry Commission plantations during the Second World War. They were recorded at large in Dalby Forest through the mid-1940s, small numbers were present in Wass Wood In 1947, some were in the Kirkbymoorside district in 1951 and in the vicinity of the old park at Helmsley in 1953. A small herd was seen near Rievaulx and colonisation of Allerston Forest was confirmed in 1956 and Fallow Deer were being observed in the Goathland district by the early 1960s (Howes, 1984).

These historical notes and bibliography covering the terrestrial mammals of the Whitby area will form a basis for future mammal studies within this diverse and fascinating region.

Acknowledgements
I would like to dedicate this review to the late Ian Thackrah, Mammal Recorder 1994-2004, and to all the mammal recorders of the Whitby Naturalists' Club past and present.

References
Arnold, H.R. (1978) *Provisional atlas of the mammals of the British Isles*. Institute of Terrestrial Ecology, Abbots Ripton.
'B.A.' (1877) *Land and Water* 14 April 1877: 265.
Barry, J.W. (1907) Notes on the changes among animals in Fylingdales, North-east Yorkshire. *The Naturalist* 32: 307-309.
Blakeborough, J.F. & Pease, A.E. (1914) *The Life and Habits of the Badger*. The Foxhound Offices, London.
Bond, I. (2012) Mammals, Amphibians and Reptiles of the North East. *Northumbrian Naturalist* 73: 1-246.
Bonnett, F. (1912) Shooting. *In*: Page, W. (ed.) *Victoria History of the Counties of England: Yorkshire* Vol. 2: 525. Archibald Constable, London.
Booth, H.B. (1923) Yorkshire Naturalists at Helmsley. *The Naturalist* 48: 246-255.
Bramley, W.G. (1933) YNU Mammal Report for 1932. *The Naturalist* 58: 21-22.
Brown, R.W. (1980) Tracking our Yorkshire mammals. *Yorks. Nat. Trust Newsletter* 6 (2): 1-2.
Capes, D.E. (2002) An initial survey of the small mammal population of a site near Great Ayton, North Yorkshire. *Imprint* 29: 25-30.
Capes, D.E. (2003) Notes from the North – 2002/2003. *Imprint* 30: 29-36.
Capes, D.E. (2005) Water Shrews in North East Yorkshire. *Imprint* 32: 36-41.
Capes, D.E. (2007) Water Shrews in Danby Dale, North Yorkshire, Their diet and habitat. *Imprint* 34: 31-42.
Capes, D.E. (2013) Water Shrews in Danby Dale, North Yorkshire, - Their Diet and Habitat. *Trans. Cleveland Naturalists' Field Club* 10(3): 31-41.
Chadwick, E.A. (2005) Post Mortem Study of Otters found dead in England and Wales Interim Report: Casualties found in 2005. School of Biological Sciences, Cardiff University.

Churchfeld, S., Barber, J. & Quinn, C. (2000) A new survey for Water Shrews (*Neomys fodiens*) using baited tubes. *Mammal Review* 30: 249-254.

Clarke, W.E. & Roebuck, W.D. (1881) *A Handbook to the Vertebrate Fauna of Yorkshire*. Lovell Reeve, London.

Clarke, W.J. (1892) Polecat in Scarborough. *Zoologist* 16: 222-223.

Corbet, G.B. (1971) Provisional Distribution Maps of British Mammals. *Mammal Review*. 1 (4/5): 95-97.

Crawford, A. (2005) *Fifth Otter Survey of England 2009-2010*. Environment Agency, Bristol.

Delany, M.J. (1985) *Yorkshire Mammals*. University of Bradford, Bradford.

Flintoff, R.J. (1931) The Grey Squirrel at Goathland, North Yorkshire. *The Naturalist* 56: 44.

Flintoff, J.F. (1933) Stoats and weasels - brown and white. *Northwestern Nat* 8: 36-45.

Flintoff, R.J. (1935) Stoats and weasels - brown and white. *Northwestern Nat* 10: 214- 229.

Flintoff, R.J. (1936) Stoats, brown and white: a new record. *Northwestern Nat* 11: 43-45.

Grabham, O. (1907) Mammalia *In*: Page, W. (ed.) *Victoria History of the Counties of England: Yorkshire,* Vol.1: 351-356. Archibald Constable, London.

Grabham, O. (1909) The Dormouse at home. *Country Life* 16 October 1909: 521-522. Illust.

Hanson, A. (1994) Return to Ashberry Pastures - the Dennis Aspinall Memorial Trap. *Imprint* 21: 12-13.

Hanson, A. (1995) Chafer Wood - the Dennis Aspinall Memorial Trap. *Imprint* 22: 9-12.

Hanson, A. (1998a) Ashberry Pastures, near Helmsley. *Imprint* 25: 6-7.

Hanson, A. (1998b) Reivaulx Terraces and Temples: The Dennis Aspinall Memorial Trap. *Imprint* 25: 12-16.

Hanson, A. (2003) National Mammal Week event at Mount Grace Priory, North Yorkshire *Imprint*: 30: 14-20.

Hanson, A. (2005) National Mammal Week event at Mount Grace Priory, North Yorkshire *Imprint*: 32: 23-26

Hanson, A. (2007) The Small Mammals of Dalby Forest, North York Moors National Park. *Imprint*: 34: 11-13.

Harris, A. & Spratt, D.A. (1991) The rabbit warrens of the Tabular Hills, North Yorkshire. *Yorkshire Archaeolohical Journal* LX111: 177-206.

Hazelwood, Mrs. A. (1940) YNU Mammal Report for 1939. *The Naturalist* 65:4-7.

Hazelwood, Mrs. A. (1946) YNU Mammal Report for 1945. *The Naturalist* 71:13-17.

Henderson, A. (1997) From Coney to Rabbit: the story of a managed coloniser. *The Naturalist* 122: 101-121.

Henderson, A. (2003) Rabbits and Rabbit Warrens. Chapter 8.6: 159-162. In Butlin, R.A. (ed.) *Historical Atlas of North Yorkshire*. Westbury, Otley.

Howes, C.A. (1983) An atlas of Yorkshire mammals. *The Naturalist* 108: 41-82.

Howes, C.A. (1984) *Changes in the status of some Yorkshire mammals, 1600-1980*. Unpublished MPhil thesis, Universty of Bradford.

Howes, C.A. (1985a) Lesser horseshoe bat *Rhinolophus hipposideros in* Delany, M.J. (ed.) *Yorkshire Mammals* (pp. 39-41). University of Bradford, Bradford.

Howes, C.A. (1985b) Barbastelle bat *Barbastella barbastellus in* Delany, M.J. (ed.) *Yorkshire Mammals* (pp. 66-68) University of Bradford, Bradford.

Howes, C. A. (1985c) Dormouse *Muscardinus avellanarius in* Delany, M.J. (ed.) *Yorkshire Mammals* (pp. 132-135) University of Bradford, Bradford.

Howes, C.A. (1986) Multi-coloured moles: Colour abnormalities in Yorkshire moles. YNU *Bulletin* 6: 12-13.

Howes, C.A. (1988) A review of badger persecution in Yorkshire. *Imprint* 10: 5-12.

Howes, C.A. (1993) Watch out ... There's a Muntjac about! *YNU Bulletin* 20: 35-36.

Howes, C.A. (1996) The history and spread of Roe Deer in Southern Yorkshire - A Review. *The Journal of Practical Ecology and Conservation, Special Publication 1*. Hallam University. pp.39-42.

Howes, C. A. (2002a) Red in Tooth and Claw: Pt. 1 The history of the Wild Cat (*Felis silvestris* Schr.) in Yorkshire. *The Naturalist*. 127: 41-56.

Howes, C.A. (2002b) Yorkshire Ermine (*Mustela erminea*) – a novel climatic indicator. *YNU Bulletin* 37 (suppl.): 75-76.

Howes, C.A. (2002c) The Yorkshire Flat Hedgehog Survey: A study of variations in population density and habitat preference of the Hedgehog in Yorkshire's Natural Areas. *YNU Bulletin* 37 (suppl.) 76-78.

Howes, C.A. (2009) Changes in the status and distribution of mammals of the order Carnivore in Yorkshire from 1600. Unpublished PhD Thesis Department of Archaeology, Geography and Environmental Sciences, University of Bradford.

Howes, C.A. (2010) Historical records of the Dormouse *Muscardinus avellanarius* on the North York Moors and adjacent areas of Cleveland and North Yorkshire. *Imprint* 37: 30-39.

Howes, C.A. (unpublished) Moles, soil types and agriculture: A hitch-hiker's guide to mole spotting.

Jefferies, D.J., Wayer, P. & Shuter, R. (2000) A brief history of the Otter Trust's successful programme of repopulating lowland England with otters bred in captivity *Otters* 3, 4.

Knight, J., Middleton, A.L.V. & Paget, R.J. (1972) National Badger Survey, report from Yorkshire. *The Naturalist* 97: 7-10.

Lovegrove, R. (2007) *Silent Fields: The long decline of a nation's wildlife*. Oxford University Press, Oxford.

McDonald, R. & Harris, S. (1998) *Stoats and Weasels*. Mammal Society, London.

Marshall, A. (2007) *Yorkshire Taxidermists: A Preliminary Catalogue and Gazetteer*. Friends of Doncaster Museums, Doncaster.

Massey, C.I. (1972) A study of hedgehog mortality in the Scarborough district, 1966-1971. *The Naturalist* 97 :103-105.

Massey, C.I. (1973) Abnormal coloured moles in Upper Eskdale, North Yorkshire. *The Naturalist* 98: 57-58.

Middleton, A.D. (1931) *The Grey Squirrel*. Sidgwick & Jackson, London.

Mitchell, W.R. (1985) Roe Deer *in* Delany, M.J. (ed.) *Yorkshire Mammals*. University of Bradford, Bradford.

Mortimer, J. (2004) Small mammals of the North York Moors Roadside Verges. *Imprint* 31: 10-11.

Oxford, G. (1992) Garbutt Wood - the Dennis Aspinall Memorial Trap. *Imprint* 18: 5.

Oxford, G. (1993) The Mice of Ashberry Pastures. *Imprint* 20: 9-10.

Oxford, G., Mortimer, J., Hanson, A., Pickles, S. & Thompson, M. (2007) Preliminary mapping of terrestrial mammal distributions in North Yorkshire 1996-2006. *The Naturalist* 132: 73- 99.

Paget, R.J. and Middleton, A.L.V. (1974) *Badgers of Yorkshire and Humberside*. Ebor Press, York.

Pease, A.E. (1887) *The Cleveland Hounds as a Trencher Fed Pack*. Longmans Green, London.

Piertney, S.B., Stewart, W.A., Lambin, X., Telfer, S., Aars, J. & Dallas, J.F.(2005) Phylogeographical structure and postglacial evolutionary history of Water Voles (*Arvicola amphibius*) in the United Kingdom. *Molecular Ecology* 14 (5): 1635-1444.

Rimington, F.C. (1956) Mammals *In* Walsh, G.B. & Rimington, F.C. (eds.) *The Natural History of the Scarborough District*, Vol. 2: 408-416. Scarborough Field Naturalists' Society, Scarborough.

Rutter, J.G. (1956) The Mammals of Pleistocene and Prehistoric Times *In* Walsh, G.B. & Rimington, F.C. (eds) *The Natural History of the Scarborough District*. Vol. 2: 419-430. Scarborough Field Naturalists' Society, Scarborough.

St Quintin, W.H. (1907) The American Grey Squirrel in Yorkshire. *The Naturalist* 32: 37.

Sheppard, T. (1915) Americal Grey Squirrel. *The Naturalist* 40: 277.

Shirley, E.P. (1867) *Some Account of English Deer Parks*. John Murray, London.

Shorten, M. (1946) A survey of the American Grey Squirrel (*Sciurus carolinensis*) and the British Red Squirrel (*S. vulgaris leucorus*) in England and Wales in 1944-5. *J. Anim. Ecol*. 15: 82-92.

Simms, C. (1972) Some north Yorkshire recent bone sites. *The Naturalist* 97: 113-114.

Simpson, G. (1969) Deer in the Pickering District Forest, past, present and future. *Yorkshire Naturalists' Union Newsletter* 9: 4.

Stephenson, T. (1900) YNU Circular no. 155 for Excursion to Whitby for Sandsend 15 September 1900.

Tapper, S. (1992) *Game Heritage: an ecological review of shooting and gamekeeping records*. Game Conservancy, Fordingbridge.

Thompson, M.J.A. (1987) Field Studies Report 1986 – Cropton Forest. *Imprint* 8: 7-8.

Thompson, M.J.A. (1988) Field Studies Report 1987 – Rievaulx Abbey. *Imprint* 10: 2-3.

Wardhaugh, A.A. (1992) Bats and their roosts in Cleveland and North East Yorkshire. *The Naturalist* 117: 99-108.

Wardhaugh, A.A. (1993) Bats and their roosts in Cleveland and North East Yorkshire II: Occasional records of the Pipistrelle and Brown Long-eared Bat. *The Naturalist* 118: 33-37.

Wardhaugh, A.A. (1994) Bats and their roosts in Cleveland and North East Yorkshire III: The Noctule Bat. *The Naturalist* 119: 34-35.

Whitaker, J. (1892) *A Descriptive List of Deer parks and Paddocks of England.* Ballantine, London.

Winter, L. (2002) Otters on the Yorkshire Coast. *Mammal News* 129: 10-11.

Whitehead, G.K. (1950) *Deer and their Management in the Deer Parks of Great Britain and Ireland.* Country Life, London.

Woodings, D. (1978) Small mammal trapping at Ellerburn Bank Nature Reserve. *Scarborough Field Naturalists' Society Annual Report for 1977*: 75-77.

Woodroffe, G.L. (1988) *Ecology of riverside mammals in the North York Moors National Park*. Unpublished M.Phil Thesis, University of York.

Woodroffe, G.L., Lawton, J.H. & Davidson, W.L. (1990a) Patterns in the production of latrines by the Water Vole (*Arvicola terrestris*) and their use as indices of abundance in population survey. *J. Zool. Lond*. 220: 439-445.

Woodroffe, G.L., Lawton, J.H. & Davidson, W.L. (1990b) The impact of Feral Mink *Mustela vison* on Water Voles *Arvicola terrestris* in the North York Moors National Park. *Biological Conservation* 51: 49-62.

Woodroffe, G.L. (1994) The status and distribution of the otter (*Lutra lutra*) in North Yorkshire. *The Naturalist* 119: 23-35.

Yalden, D.W. (1982) When did the mammal fauna of the British Isles arrive? *Mammal Review* 12(1): 1-57.

Yalden, D.W. (1999) *The History of British Mammals.* T & A D Poyser, London.

Discovering the palaeontology of the Whitby coast

Dean R. Lomax

Whitby is a name familiar to most fossil collectors in Britain and Europe and specimens from Whitby feature in museum (and private) collections around the world. This part of the Yorkshire coast is often labelled the 'Dinosaur Coast', an illustrious section of coastline which has produced some spectacular fossil finds over many years. Strictly speaking, Whitby is just one location within the 'Dinosaur Coast' but is often portrayed as the only fossil-bearing locality. Thus, many eager fossil hunters collect at this one location. However, the Whitby coast consists of about 10 primary fossil-bearing localities stretching from Staithes in the north to Ravenscar in the south, each yielding a variety of fossils from the geological beds and their subdivisions. The localities also offer some of the most beautiful scenery in Yorkshire (Plate I, centre pages).

Rocks around Whitby are roughly between 170 and 200 million years old, dating to the Jurassic Period which is one of three geological periods that make up the Mesozoic Era, a stretch of time informally termed 'the age of reptiles'. The majority of rocks belong to the Lower Jurassic (Lias) and consist of mudstones, shales, sandstones and ironstones. Arguably, the fossils collected from the Lower Jurassic along the Whitby coast are amongst the best – and most well preserved – from the British Isles, rivalling those from the Dorset coastline. Dinosaur footprints are also found in the slightly younger Middle Jurassic formations and deposits.

Many fossils, including internationally important specimens, have been found along the Whitby coast. The first recording of a fossil (a crocodilian) collected for science dates to the 1700s but many of the large and most complete discoveries were made during the quarrying for alum, which was a large, booming industry in the area during the 1800s. Some of the internationally important remains include Type specimens (the first to be described). These, and many others, have been (and are still being) described by palaeontologists in scientific journals around the world.

One quite marvellous find was reported as far back as 1888. The almost complete skull and braincase of a pterosaur (flying reptiles, informally and wrongly called 'flying dinosaurs') was collected from the Upper Lias at Loftus (previously called Lofthouse), one of the inland quarries near Whitby. This skull was significant as it represented the first pterosaur collected from Yorkshire and was the only specimen of a pterosaur from the Yorkshire coast until recently,. Pterosaurs were already recorded from Germany and several had been collected at Lyme Regis by the famous fossil hunter Mary Anning. The Whitby pterosaur was eventually described as a new species, *Parapsicephalus purdoni*. However, with only a skull and lacking other bones, some palaeontologists suggest that the specimen represents a dubious pterosaur taxon, a *nomen dubium*. Nevertheless, it is still regarded as one of the best skulls of its type of an Early Jurassic pterosaur. A rather fragmentary skeleton of a pterosaur was found at Saltwick Bay, south of Whitby, on October 18 2011, by fossil collector David Groocock. The specimen comprised portions of the pectoral girdle and a left humerus. It has been tentatively assigned to *P. purdoni* pending further discoveries of more complete remains.

A great variety of fossils has been discovered along this coastline. Ferocious marine reptiles such as ichthyosaurs, plesiosaurs and primitive crocodilians once ruled the seas and their many remains, now held in museums such as Whitby Museum, form important historic collections. As well as these super predators, a huge range of invertebrate life has been recorded, including cephalopod molluscs such as the famed ammonites and belemnites (Plate I, centre pages). They are amongst some of the most commonly found fossils. In addition, a whole host of other material has been recorded including crustaceans (lobsters and crabs), elegant echinoderms (such as brittle stars and echinoids) and fabulously preserved fish (including sharks!). Terrestrial remains are also plentiful and have been well documented. They include an abundance of plants, representing numerous species, and even dinosaur footprints, all of which are almost exclusively collected from the sandstones. The dinosaur tracks have been found in large variety and in huge number, including individual trackways, and have been identified as belonging to sauropod, theropod and ornithopod dinosaurs. However, one type of footprint was attributed to a stegosaur, making it one of the oldest occurrences of this group in the world.

The Whitby coast is a prime location for a fossil hunter; it is great for beginners as well as those with a thorough interest in the subject. With such a diversity of fossils discovered along this coastline, it helps portray a vivid picture of the ecosystems millions of years ago around the area we now call Whitby.

Today, spectacular finds are few and far between, though each year the coastline yields some very exciting discoveries. Recent ones have included the aforementioned fragmentary pterosaur, several partly complete ichthyosaurs and new species of gastropod molluscs. Sadly, reduced scientific attention towards the Whitby fossils has resulted in many specimens becoming somewhat neglected, scientifically speaking. Much of the taxonomic work is outdated and in need of a thorough review, something that is hopefully going to change. Who knows, a whole bunch of new species is probably waiting to be discovered, out in the field and in museum collections!

Further reading

Benton, M.J. & Spencer, P.S. (1995). *Fossil Reptiles of Great Britain* 386pp. Chapman and Hall, London.

Lomax, D.R. (2011). *Fossils of the Whitby coast: A Photographic Guide* 132pp. Siri Scientific Press, Manchester.

Lomax, D.R. & Tamura, N. In press. *Dinosaurs of the British Isles*. Siri Scientific Press 416pp, Manchester.

Robert Wynne Owen (1924-1985) and his parasitological collections at Leeds: 2. Parasites of amphibians, reptiles, birds and mammals with particular reference to Yorkshire

R. A. Baker, C. R. Fletcher and P. J. Mill
School of Biological Sciences, University of Leeds, Leeds, LS2 9JT

A biography of Robert Wynne Owen was provided in a previous paper (Baker *et al.*, 2013) which included details of his collection of spirit specimens of fish parasites and his parasitological microscope slides. The present paper deals with the spirit specimens of parasites found in and on amphibians, reptiles, birds and mammals. This collection is housed in the Museum of the History of Science, Technology and Medicine, School of Philosophy, Religion and History of Science, University of Leeds. The parasite collection now being considered is less well documented than the fish parasite collection (Baker *et al.*, 2013) in terms of host identification and location as well as the taxonomy of the parasites themselves. Wynne Owen was primarily an expert on the parasites of fish so this is to be expected.

Comments on the collection

There are 238 tubes overall (some of which are numbered) containing material from the following phyla of parasites: Acanthocephala, Arthropoda, Nematoda and Platyhelminthes; 79 of the tubes have information on locality and 195 contain information on the host. The collecting period in the main is from the 1940s (when Wynne was at Aberystwyth) to the 1980s, though some material has been incorporated from other sources dating back to the 1910s and 1920s. Some was clearly intended for class use at the University of Leeds and is so labelled, such as *Nippostrongylus brasiliensis* (May 1974) from the laboratory rat and *Gorgoderina* from the Common Frog *Rana temporaria*.

Although most specimens are from the United Kingdom there is a small amount of material from abroad, including West Africa, Kenya, Dutch Guinea, Belgium, USA and Rangoon. This includes *Dinobothrium planum* from the spiral valve of the Basking Shark from Monterey Bay, California, Cat Fleas *Ctenocephalides felis* from Rangoon and ticks from Kenya.

There are seven tubes from the collection of a R.S.B. Brown. These are all parasites of fish (Grey Gurnard, Flounder and Turbot). No locations are given and they were not included in Wynne's fish parasite collection as they were neither collected by him nor by one of his students. There is also a small amount of other fish parasite material in the collection, including:

- *Lacistorhynchus tenuis* from Garfish *Belone belone*
- *Cernaeoceia lucei* from Pouting *Trisopterus luscus*
- *Bomolochus soleae* from Cod *Gadus morhua*
- *Lepeophtheirus pectoralis* and *Acanthochondria* sp. from Flounder *Platichthys flesus*
- *Caligus diaphanus* from Grey Gurnard *Eutrigla gurnadus*
- *Lepeophtheirus thompsoni* from Turbot *Psetta maxima*
- *Dinobothrium planum* and *Anthosoma crassum* from Basking Shark *Cetorhinus maximus*.

Other hosts include amphibians, reptiles, birds and mammals, together with a small number of invertebrates. Most of the collection comprises endoparasites but does include some ectoparasitic arthropods.

Amphibian and reptilian hosts are not particularly well represented. Amongst the amphibians are a number of parasites from the Common Frog, including an acanthocephalan, trematodes, nematodes and cestodes from different parts of the body. There are both strongylid and oxyurid nematodes from the Common Toad *Bufo bufo* and other nematodes from the African Clawed Toad *Xenopus laevis*. Among the reptiles are nematodes and trematodes from the Grass Snake *Natrix natrix* and an oxyurid nematode from the Spur-thighed Tortoise *Testudo graeca*. There are cestodes, trematodes and nematodes from Rainbow Lizards *Agama agama* from W. Africa.

Birds are very well represented. Parasites include trichiurid nematodes from a variety of ducks (domestic, Muscovy *Cairina moschata,* Scaup *Aythya marila*) and domestic goose. There are *Capillaria* sp. from the Fieldfare *Turdus pilaris* and strongylid nematodes from the Turkey *Meleagris galloparvo*, an acanthocephalan from Teal *Anas crecca*, a variety of nematodes from domestic fowl *Gallus gallus domesticus*, tetrabothrid cestodes from Fulmar *Fulmarus glacialis*, various nematodes and trematodes from gulls (Herring *Larus argentatus* and Lesser Black-backed *Larus fuscus*), a cestode from Jay *Garrulus glandarius*, nematodes from Tawny Owl *Strix aluco* and Wheatear *Oenanthe oenanthe*, cestodes from Oystercatcher *Haematopus ostralegus*, cestodes and nematodes from Rook *Corvus frugilegus*, thrush, Starling *Sturnus vulgaris* and Woodcock *Scolopax rusticola*. There are also ticks from Sand Martin *Riparia riparia* and mites from a pigeon roost.

Most of the material is from mammalian hosts, mostly domestic animals including nematodes from domestic cat *Felis catus*, *Toxoscaris leonina* from domestic dog *Canis lupus familiaris*, cestodes and nematodes from domestic cattle *Bos primigenius*, domestic sheep *Ovis aries* and Rabbit *Oryctolagus cuniculus*, a strongylid nematode from domestic pig *Sus domestica*, cestodes and strongylid nematodes from domestic horse *Equus ferus* and laboratory rat, an oxyurid nematode and a digenean trematode from a laboratory mouse, nematodes from hamster (Cricetinae), Fox *Vulpes vulpes*, Weasel *Mustela nivalis* and a wallaby, a trematode from a Porpoise *Phocoena phocoena*, nematodes and an acanthocephalan from a seal (probably Grey Seal *Halichoerus grypus*) and a cestode from a whale. There is also a pentastomid from a Rabbit, fleas from a cat and ticks from a sheep.

There are parasitic worms from a range of host body regions including the bladder, brain, bronchial system, digestive system, gall bladder, kidney, liver, vascular system and from the abdominal cavity. In the digestive system of mammals there are examples of parasites from the oesophagus, stomach, duodenum, small and lower intestine, colon, rectum and, in birds, the proventriculus and gizzard. In the respiratory system there are parasites from the trachea, bronchi and bronchioles.

Aberystwyth

All the material from Wynne's time in Aberystwyth (1940s to 1952) was from birds or mammals (Table 1). There are 13 tubes of specimens from this period that contain information on the locality from which the hosts were obtained; some specimens were from laboratory animals.

Table 1. Parasites of birds and mammals from Aberystwyth.

Parasite	Host	Host site
Nematoda		
Ascaridia galli	Domestic fowl *Gallus gallus domesticus*	Intestine, small
Capillaria aerophila	Fox (vixen) *Vulpes vulpes*	Bronchii
Haemonchus contortus	Lamb (experimental) *Ovis aries*	Stomach-4th
Heterakis gallinae	Domestic fowl	Caeca
Tetrameres fissispina	Domestic ducks *Anas/Cairina*	Proventriculus
**Trichonema*	Horse *Equus ferus*	Colon
Toxocara	Fox *Vulpes vulpes*	Intestine

Parasite	Host	Host site
Platyhelminthes- Cestoda		
Cysticercus bovis	Cow *Bos primigenius*	Heart
Echinococcus granulosus (hydatid worm)	Man *Homo sapiens*	Liver
Paranoplocephala mamillana	Horse *Equus ferus*	Duodenum
Taenia taeniaeformis	Rat (wild) *Rattus*	Liver

* = probable species.

Yorkshire

The Yorkshire collections are derived from the time Wynne was at Leeds University (1952-1985) and were made between 1955 and 1984. There are 40 tubes containing parasites with details of locality including Acanthocephala; Arthropoda (fleas and mites); Crustacea; Nematoda and Platyhelminthes (11 cestodes and 3 trematodes). There are 14 entries under Robin Hood's Bay and 14 from various places in Leeds, including Hawksworth (Horsforth), Kirkstall, Paul's Pond (Adel/Cookridge) and Rodley. Apart from parasite, host and locality, further details are provided in some cases, such as eggs, sex and/or numbers of the parasite and fixative used.

Some of the samples indicate that material has been sent to him for identification, for example parasites from the frontal sinuses of a Weasel from York identified as *Skrjabingylus nasicola*, where details are given of the number of male and female parasites from the left and right sinuses (totals left 8 males and 14 females, right 5 males and 11 females). Where there is complete or almost complete information, this is summarized in Table 2.

Table 2. Parasites collected from a variety of hosts in Yorkshire.

Parasite	Host	Host site	Location
Acanthocephala			
spiny-headed worm	Starling *Sturnus vulgaris*		Rodley, Leeds
Arthropoda/Arachnida			
mites	Pigeon roost **Columba livia domestica*		Leeds

Parasite	Host	Host site	Location
Arthropoda/Crustacea			
Athelges paguri			Robin Hood's Bay
Athelges	Hermit Crab **Pagurus bernhardus*	Abdomen	Robin Hood's Bay
Bomolochus soleae	Cod *Gadus morhua*	Nostrils	Robin Hood's Bay
copepod eggs (monstrillid)	Dog whelk *Thais lapillus*		Robin Hood's Bay
Lernaeocera branchialis			Robin Hood's Bay
Nematoda			
Ascaridia galli	Domestic fowl *Gallus g. domesticus*		Leeds
**Aspiculuris tetraptera*	Mouse (lab) *Mus*	Caecum	Leeds
Capillaria	Rook *Corvus frugilegus*	Intestine	Bingley
nematode	Hermit Crab	Abdomen	Robin Hood's Bay
nematode	Starling *Sturnus vulgaris*	Oesophagus	Rodley, Leeds
Oswaldocruzia	Toad, Common *Bufo bufo*	Intestine	Paul's Pond, Leeds
oxyurid	Toad, Common	Intestine	Paul's Pond, Leeds
Skrjabingylus nasicola	Weasel *Mustela nivalis*	Sinuses-frontal	York
Strongylus sp.	Horse *Equus ferus*		Keighley
Tetrameres	Gull, Lesser Blackbacked *Larus fuscus*		Robin Hood's Bay
Toxascaris leonina	Cat *Felis catus*		Leeds
Toxascaris leonina	Dog *Canis lupus familiaris*	Intestine	York
Platyhelminthes - Cestoda			
cestode	Starling		Rodley, Leeds
cestode	Sheep *Ovis aries*		Leeds
Dilepis	Rook *Corvus frugilegus*		Hawksworth, Leeds
Dilepis undula	Thrush *Turdus* sp.		East Keswick
**Hymenolepis serpentulus*	Jay *Garrulus glandarius*	Intestine	Harewood, nr Leeds
Tetrabothrius	Fulmar *Fulmarus glacialis*	Intestine	Robin Hood's Bay
Platyhelminthes - Trematoda			
Gasterostomum lophius			Whitby
Plagiorchis elegans	Snail, Great Pond *Lymnea stagnalis*		Kirstall, Leeds
Parorchis	Gull, Herring *Larus argentatus*	Rectum	Robin Hood's Bay
rediae (larvae)	Limpet *Patella vulgata*		Robin Hood's Bay

*= probable species.

Four of the 40 tubes have limited information and hence are not included in the table. One contains an unidentified parasite from the gonad of a China Limpet *Patella aspersa* from Filey;

another contains a possible specimen of the hen flea *Echidnophaga gallinacea* from an unidentified host from Weetwood, Leeds. There is a tube containing a parasite from a pond in Farnley, Leeds, labelled FN11, and another which contains psocids (bark lice, which are not parasitic) from Middlesborough. As can be seen from Table 2 there are some parasites from molluscan and mammalian hosts but a notable feature of the Yorkshire collection is the numbers and species of bird hosts.

The collection can be seen by contacting the Director of the Museum of the History of Science, Technology and Medicine at the University of Leeds (Dr Claire L. Jones - c.l.jones@leeds.ac.uk), from whom a copy of the database is also available.

Acknowledgements
The authors would like to thank Claire Jones and Kiara White from the School of Philosophy, Religion and History of Science, University of Leeds.

Reference

Baker, R.A., Bradley, C. and Mill, P.J. (2013) Robert Wynne Owen (1924-1985) and his parasitological collections at Leeds: 1. Microscope slides and fish parasites. *The Naturalist* 138: 192-202.

Notes on the distribution and habitat associations of dolichopodid flies in Yorkshire

Roy Crossley 1 The Cloisters, Wilberfoss. York YO41 5RF
email: roycrossley@btinternet.com

With about 7,000 species world-wide[1], the Dolichopodidae is a species-rich family of Diptera. There are currently 300 British species[2], of which 238 have been recorded in Yorkshire[3]. British dolichopodids range in size from 1.5mm to 7.0mm and many of them are metallic-green with slightly laterally-flattened abdomens. Most are thought to be predatory at all stages of life and there is often an affinity with wetland habitats.

There is a long history of collecting and recording dolichopodids in Yorkshire with a few records going back to the latter part of the 19th century, but interest in the family began in earnest with the legendary W.J. Fordham and C.A. Cheetham in the 1920s. Since those days many

[1] See *Flies: the natural history and diversity of diptera* by Stephen A.Marshall. Firefly Books Ltd, 2012. The most recent (and comprehensive) review of the Order world-wide. Copiously illustrated.

[2] Numbers and nomenclature follow Chandler, P.J. (1998 with up-dates). Checklists of Insects of the British Isles (New Series), Part 1: Diptera. *Handbk Ident. Br. Insects* 12 (1): 1-234

[3] Information per A.Grayson (in prep.) *A Provisional List of Yorkshire Diptera*; also YNU dolichopodid record cards held by the author.

entomologists have contributed records and there has been a considerable growth in interest since the early 1980s.

Sufficient records have been amassed over the years for some patterns of distribution to be identified, usually without any obvious cause. The 'widespread and common' species include, for example, *Dolichopus plumipes, D. trivialis*, *D. ungulatus*, *Campsicnemus curvipes*, *Sympycnus desoutteri* and *Syntormon pallipes*, all of which seem to occur wherever flies are sought. However, the majority have a much more restricted distribution. For example, 71 Yorkshire dolichopodids (c.33%) have been recorded from fewer than five localities in the county, and 22 of these (c.10% of the total fauna) are known from only one locality – and often from a single specimen. An example of the latter is the Red Data species *Dolichopus lineatocornis*[4] which is known in Yorkshire from a single male found at North Duffield Carrs in 2007. Repeated attempts to re-locate the fly here and in similar habitats in the general vicinity have proved unsuccessful.

What appear to be clear geographical distribution patterns in the county can be seen in some species. For example, *Dolichopus campestris, D festivus* and *D. latelimbatus* have a predominantly eastern distribution whereas *D. longitarsis* and *D. urbanus* are predominantly northern, as is *Rhaphium albomaculatum*. Such observations must, of course, always be treated with caution when applied to any group of animals which are studied by a mere handful of naturalists! The old adage that 'a good place for insects is where an entomologist has lived' still applies; collector bias is also an ever present possibility.

Some dolichopodids demonstrate clear habitat associations which are determined by their life histories. Good examples are the two Yorkshire species of *Aphrosylus* - *A. celtiber* and *A. ferox*. Adults of the former, which are c.4mm long, are found running around on barnacle-covered rocks in the inter-tidal zone. It is known that the larvae of an un-named *Aphrosylus* species parasitise limpets and barnacles (Parent, 1938, p.332) and circumstantial evidence suggests that this may be the case with *A. celtiber.* I have swept *A. ferox* in quantity from rotting seaweed on the beach at Dane's Dyke, which suggests that this much smaller fly may breed in such an environment. Both have been recorded from Spurn and Cayton Bay and *A. celtiber* also occurs at Reighton Sands. Other Yorkshire coastal localities for *A. ferox* are Sandsend and Hayburn Wyke.

There is a suite of dolichopodid flies associated with coastal salt-marshes and these have been described in some detail in earlier notes (Crossley, 1996; 2007). Two, which are regularly found on the south bank of the Humber as far north as Tetney, North Lincolshire, have still not been recorded on the Yorkshire side of the estuary. These are *Muscidideicus praetextatus* and *Dolichopus notatus*, both of which are Nationally Notable. Some typical salt-marsh species occur well inland in the linear expanses of saline and brackish habitats which border the shore of the Upper Humber. In recent years representatives of this community have been found upstream from North Ferriby, including *Dolichopus diadema*, *Hydrophorus oceanus*, *Machaerium maritimae* and *Campsicnemus armatus*. *H.oceanus* is the most abundant and widespread of salt-marsh dolichopodids and, as mentioned in an earlier note (Crossley, 2007), can be found as far

---

[4] National statuses follow Falk, S.J. and Crossley, R. (2005) *A Review of the Scarce and Threatened Flies of Great Britain, Part 3: Empidoidea.* Species Status No.3, Joint Nature Conservation Committee. Peterborough

as the outer parts of the Glasswort *Salicornia* zone which are subject to twice-daily flooding. The flies sometimes occur in huge numbers on the soft mud and can be seen skating on the still waters of the gutters at low tide. The practice of 'mate guarding' has been described in this species (Dyte, 1988); after copulating the small males often ride 'piggy-back' on the larger females, remaining thus for long periods, and the females can be seen making short flights carrying the attendant males. Presumably this habit ensures that no other male can mate with the female. Couples will often remain paired in this way after being placed in a specimen tube.

Another habitat which supports a distinctive dolichopodid fauna is wet, or at least moist, peat. Moorland peat bogs in the Pennines and the North York Moors support a number of dolichopodids which are generally thought of as being 'upland', and the pattern of their distribution is mainly western and northern in the county. Examples are *Dolichopus atripes*, *D. rupestris, Hydrophorus nebulosus*, *Rhaphium longicorne* and *Campsicnemus alpinus*. However, some of these species also occur at lowland peat sites such as are found at Askham Bog, Skipwith and Strensall Commons and Thorne and Hatfield Moors. *D. atripes*, *D. rupestris*, *H. nebulosus* and *C. alpinus* fall into this category, so in some cases it seems as if it is habitat and not altitude which determines distribution. In addition, there is the Nationally Notable *Gymnopternus angustifrons*, which is associated exclusively with lowland peat and whose distribution in Yorkshire stretches from Askham Bog and Strensall Common in the north to Thorne Moors in the south. A recent 'peat-associated' discovery in the County has been *Dolichopus phaeopus*. Found originally in 1994 in the vicinity of dykes in the peat-based old pastures near the Pocklington Canal at Thornton, it has subsequently been found at several moorland peat bogs on the North York Moors and at two Pennine sites (one of which was, unexpectedly, a river bank).

An intriguing distribution is that of *Sympycnus spiculatus.* To date, all but two Yorkshire records are from calcareous sites in the north-west, typically from places such as Grass Wood, and in the north-east from Duncombe Park and Forge Valley. In my experience the fly appears to be associated with Dog's Mercury *Mercurialis perennis*.

A habitat association of a different kind is that of *Dolichopus migrans* (see Plate II, centre pages). Until the late 1990s this Red Data insect was thought to be confined to the dry sandy Breckland of East Anglia with an outlying population at Risby Common in North Lincolnshire. In 1998 specimens were found at what is now the Calley Heath Nature Reserve of the Yorkshire Wildlife Trust, near Barmby Moor. A strong population is established at this sandy site where specimens occur in dry grassland. I have long felt that there are likely to be other suitable places for this species in the general area, and there was a report in 2013 of a single specimen having been found in dry grassland at the site of the medieval village of Towthorpe near Market Weighton, some 13km east of Calley Heath (I. Andrews *pers. comm.*).

The Nationally Notable *Dolichopus cilifemoratus* is at its most numerous in Britain in the vicinity of field dykes throughout the winter-flooded hay meadows of the Lower Derwent Valley. In recent years it has also been found in quantity in the similarly winter-flooded Fulford Ings on the banks of the River Ouse, south of York. In 2008 a single female was found at Rosekirkdale Fen near Troutsdale, a quite atypical habitat on the edge of the North York Moors and well beyond its normal range. A second aberrant record of another singleton was from Decoy Wood at

Escrick in 2001. These types of records, where insects turn up in unexpected places, quite outside their normal range and typical habitat, raise interesting questions. Is it that we don't really understand what is a 'typical' habitat or that the discovery of an isolated, 'stray' specimen is pure chance? Might they have floated down from some wind-drifted cloud of aerial plankton?

How can the presence at recently excavated lowland sand and gravel pits of species such as *Campsicnemus marginatus*, a dolichopodid typically found on the shingle of upland rivers, be explained except as wind drifted? This insect has been recorded over the past twenty years from sand and gravel excavations at Hay-a-Park (Knaresborough), Nosterfield and North Cave Wetlands. Hopefully, a second paper will deal exclusively with the colonization of a Yorkshire gravel pit by this and many other dolichopodids.

Finally, two large and conspicuous dolichopodids are worth comment. *Liancalus virens*, our largest species, measuring up to 7mm, is beautifully metallic and the male has conspicuous tiny white spots at the tips of the wings (see Plate II, centre pages). Although its life history, as with most dolichopodids, is unknown, it is likely to be predatory. This fly is widespread but localized, because it lives on vertical surfaces in the vicinity of running water, such as algal beds bordering waterfalls or lesser trickles. Thus it can be found on coastal cliffs, in woodland, even on the overflows on canals. Apart from the coastal sites the majority of records come from western and upland localities.

The second example is *Poecilobothrus nobilitatus* (see Plate II, centre pages). This relatively large (6mm) fly is a beautiful metallic green and the male has conspicuously darkened wings with milky-white tips. Males often swarm on the surface of puddles in rutted cart tracks or at the edges of pools, where they indulge in wing-flicking displays as they skate around on the water surface. It is interesting that the first Yorkshire report of this conspicuous fly was as late as 1919. This was from the Bubwith area. The next was in 1936 at Kilnwick Percy and Barmby Moor, and then in 1940 at Wombleton and at Spurn in 1953. It was not until the 1980s that records started to accumulate and even now, although widespread across much of the county, it has not yet been reported from the area west of grid line SE1000. This is such an attractive fly that it is unlikely to have escaped the attention of the early recorders of Yorkshire Diptera, which suggests that it has genuinely spread north and eastwards across the County during the past thirty or forty years.

Acknowledgements
Thanks are due to all those past and present entomologists who generously submit records, and to past YNU Recorders who have maintained them over the years. Without their dedication accounts such as this would not be possible.

References
Crossley, R (1996). Notes on the Empidoidea (Diptera) of a Yorkshire salt-marsh. *The Naturalist* 121: 67-69.
Crossley, R (2007). Notes on some Diptera of a North Lincolnshire salt-marsh. *The Naturalist* 132: 108
Dyte, C.E. (1988). Mate guarding and sex ratio in *Hydrophorus oceanus* (Macquart) (Diptera: Dolichopodidae). *Entomologist* 107 (2): 122-126.
Parent, O. (1938). Diptères Dolichopodidae. *Faune Fr.* 35: 1-720

Mapping changes in the distribution of the Dark Green Fritillary in VC64 between 2000 and 2010

Terence M. Whitaker
e-mail: t.whitaker1@btinternet.com

Introduction to the Dark Green Fritillary

The Dark Green Fritillary *Argynnis aglaja* (DGF) is a local, single-brooded, large fritillary butterfly with adults flying from June to the end of August, the exact flight period depending on the weather (for photographs, see front cover and Plate III, centre pages). It is encountered in a variety of biotopes with abundant violets, from the early seral stages of woodland to heathland, moorland and grassland. Its main food plants are Common Dog-violet *Viola riviniana* and Marsh Violet *V. palustris* but Hairy Violet *V. hirta* is also used on calcareous sites. Adults are highly mobile and tend to occur at low densities over large areas in which there are small patches of suitable breeding habitat. On the best sites with a greater concentration of breeding habitat the adults can become more numerous and the colonies occupy more discrete areas (Asher *et al*., 2001). For more details of its biology and life history see Clough (2005) and Thomas & Lewington (2010).

In the few detailed mark-and-recapture studies the adults were found to move freely within each breeding area but most seemed to stay within their own colonies, moving less than 1km. In a very few cases the butterfly was observed to have moved up to 5km from known breeding areas (Warren, 1994, Whitaker 2006). Discrepancies in observed adult sex ratios may indicate that a proportion of freshly emerged females emigrate (unpublished data from Whitaker, 2006).

The past status of the butterfly

Populations of the Dark Green Fritillary have fluctuated during the past century but its distributions and populations have mainly declined. It was quite well-distributed in Yorkshire until the 1850s but probably mainly in the uplands. Set against the long-term distribution decline, population levels of the Dark Green Fritillary have increased since the 1970s (Fox *et al*., 2006). Records in the decades prior to 2000 have mainly come from the North York Moors National Park (NYMNP) and the Yorkshire Dales National Park (YDNP), near to the only sites where it was known as resident. Records from outside the National Parks included a scatter of reports and unconfirmed sightings of large fritillaries in the eastern Pennines in west central Yorkshire, where the butterfly has had a long history of solitary records and occasional colonisation (Clough, 2005; Whitaker, 2004). Between 1995 and 2002 the DGF was only recorded from 14 Yorkshire 10km squares (Whitaker, 2004). Since 2000 many more records have been submitted to Butterfly Conservation (Yorkshire Branch) and much more has been discovered about its behaviour and distribution in the west of Yorkshire (Clough, 2005; Whitaker, 2006, 2007).

Observations of Dark Green Fritillary

The location information from the records described above was entered into MapMate software in order to follow the distribution change of the butterfly. The resulting maps are shown below.

Table 1. Relationship between the number of VC64 tetrads recorded and the tetrads where Dark Green Fritillary was reported.

Year	Recorded VC64 tetrads	Tetrads with DGF	Tetrads with DGF as % of tetrads recorded in that year	Tetrads with DGF as % of all tetrads recorded 2000-10
2000	227	2	0.88	0.21
2001	118	2	1.69	0.21
2002	336	3	0.89	0.32
2003	445	10	2.25	1.07
2004	471	19	4.03	2.03
2005	375	19	5.07	2.03
2006	361	29	8.03	3.10
2007	336	36	10.72	3.85
2008	266	35	13.16	3.74
2009	343	29	8.45	3.10
2010	329	40	12.16	4.28

Notes:

- In the period up to 2004 there was a slight tendency for more observer effort in recording more tetrads to result in more DGF sites being recorded.
- After 2004 more observer effort resulted in proportionally less DGF sites being reported. Plotting a linear regression of these two variables over the period 2000 to 2010 the graph (Fig. 1) below is obtained. Between 2000 and 2004 a slightly positive linear regression accounts for 67% of the variance but afterwards, between 2005 and 2010, 39% of the variance is explained by an inverse linear relationship. Overall less than 0.07% of the variance is explained by this simple relationship.

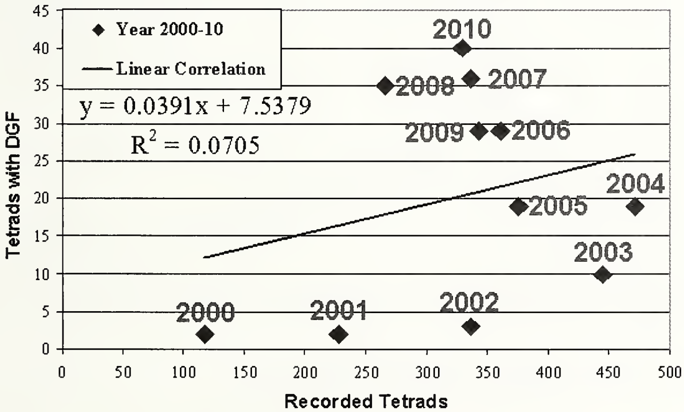


Figure 1. Correlation between tetrads with DGF and total recorded tetrads, 2000-2010.

Conclusions supported by Figure 1 are that the observed increase in tetrads where DGF was reported is NOT related to observer effort. This is related to a true population and range expansion of the butterfly, which started in 2003-2004. Regarding the progression of population and range expansion, in most years there are some records of solitary DGF. These vagrants appear to represent the capacity for colonisation by the butterfly and are more numerous in the

warmer summers. (Figs. 2 & 3).

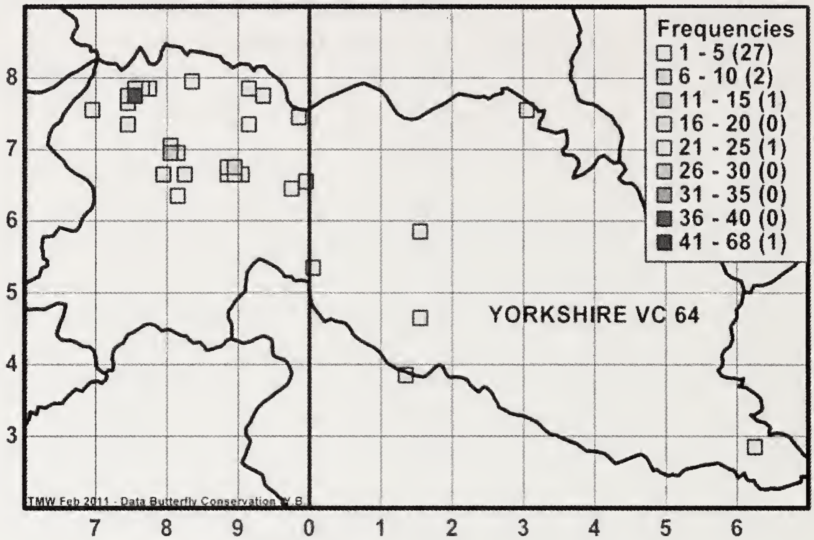


Figure 2. Recorded frequencies of Dark Green Fritillary 2000-2004

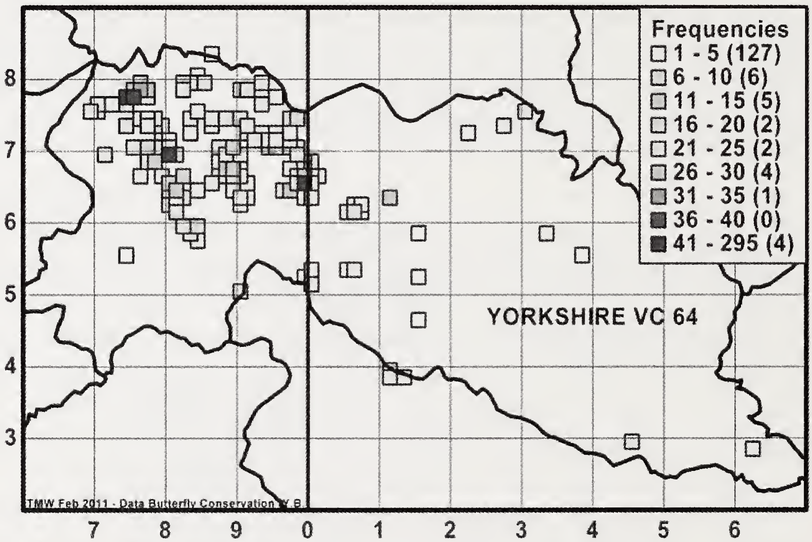
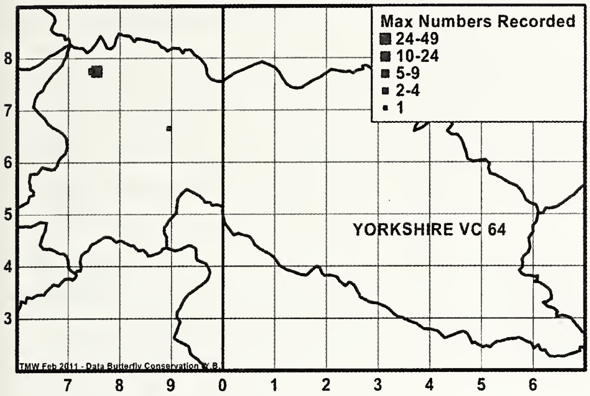


Figure 3. Recorded frequencies of Dark Green Fritillary 2000-2010

The figures below show the expansion of the butterfly in the years 2000-2010:

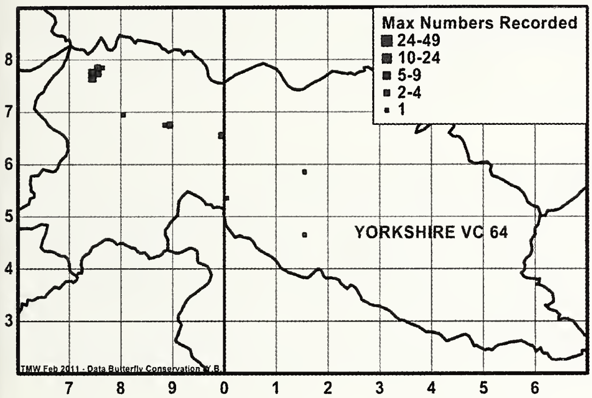
Dark Green Fritillary 2000



Years 2000 to 2002

Foot and mouth disease epidemic in VC64 in 2001-2002. Subsequently grazing intensity reduced over much of the south-eastern dales. The butterfly was only regularly recorded from one location (Scar Close NNR).

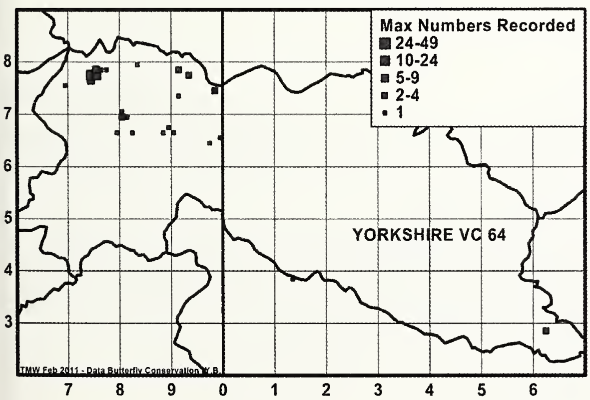
Dark Green Fritillary 2003



Year 2003

Recorded mainly from Scar Close NNR and nearby Ribblehead but a scatter of records from Swarth Moor SSSI, Malham Tarn and Grass and Bastow Woods. Is this the start of a south-easterly spread from Scar Close NNR?

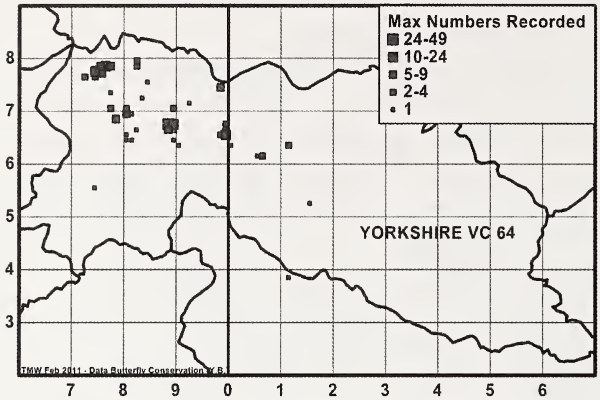
Dark Green Fritillary 2004



Years 2004 to 2005

A scatter of records in new locations adjacent to Swarth Moor SSSI, Malham Tarn and Grass and Bastow Woods. Sightings near Settle (Giggleswick Scar). A significant number of records from Upper Wharfedale and Langstrothdale; from Kettlewell to Greenfield Forest. Is this evidence of an easterly spread from Scar Close NNR and Ribblehead through Greenfield Forest into Upper Wharfedale?

Dark Green Fritillary 2006



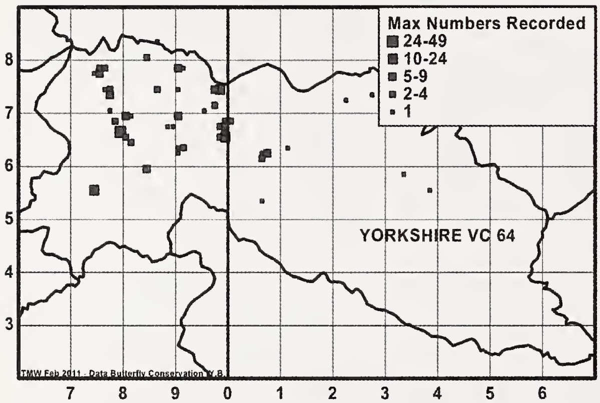
Year 2006

A year with an exceptionally warm and sunny flight period. Records from new locations, further east (Trollers Gill and Duckstreet) and also from Littondale and Gisburn Forest. Larger numbers recorded northwest of Settle (including Swarth Moor SSSI, Wharfe & Oxenber Woods SSSI and Giggleswick Scar), Malham Tarn area and Grass and Bastow Woods. Numbers increase and the population expands.

Year 2007

A year with a wet and changeable flight period. First records from Long Preston Moor. Larger numbers recorded from Upper Wharfedale and Littondale (including Kettlewell, Grassington area and Cowside Beck). Numbers increase and the population expands.

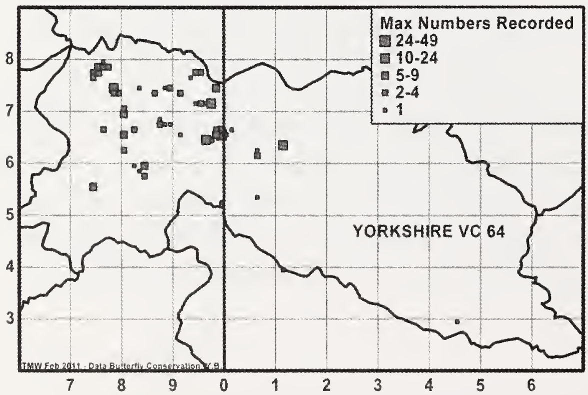
Dark Green Fritillary 2008



Years 2008 and 2009

The flight periods in 2008 and 2009 were poor. Larger numbers recorded from around Ingleborough, Long Preston Moor, Gisburn Forest, Littondale, Upper Wharfedale, Grassington area, Trollers Gill and Duckstreet. Numbers increase and the population expands.

Dark Green Fritillary 2010



Year 2010

Some retrenchment in the east of the vice-county, but a continued increase in the core areas in the west.

Conclusions

The observed increase in tetrads where the fritillary was reported is proven statistically to be unrelated to observer effort. This is a true population and range expansion eastward which started in 2003-2004.

In the ten years 2000-2010 the abundance of the Dark Green Fritillary has changed from less than one percent to over twelve percent of recorded tetrads in VC64. It has spread eastward from a single site (Scar Close NNR) in northwest Yorkshire to become established on at least 12 new sites in the YDNP and Pennine uplands, almost as far east as Pateley Bridge.

References

Asher, J., Warren, M.S., Fox, R., Harding, P.T., Jeffcoate, G. & Jeffcoate, S. [eds] (2001) *The Millennium Atlas of Butterflies in Britain and Ireland*. 433pp. Oxford University Press.

Clough, S.A. (2005) 1607 The Dark Green Fritillary *in* Frost H.M. (ed) *The Butterflies of Yorkshire*: 183-187. Butterfly Conservation Yorkshire, Butterfly Conservation, East Lulworth, Dorset.

Fox, R., Asher, J., Brereton, T., Roy, D. & Warren, M. (2006) *The State of Butterflies in Britain & Ireland*. Butterfly Conservation & CEH., Nature Bureau, Newbury. 112pp.

Thomas, J. & Lewington, R. (2010) *The Butterflies of Britain and Ireland* [New Edn.]. British Wildlife Publishing, Gillingham. 288 pp.

Warren, M.S. (1994) *Autecology and Conservation Needs of the High Brown Fritillary*, Unpublished Report to English Nature, Exeter.

Whitaker, T.M. (2004) Fritillary Butterflies of the Yorkshire Dales National Park. *YNU Bulletin Supplement* 42: 55-73 + 4pl.

Whitaker, T.M. (2006) *Population Estimates and Relationship to Population Indices in the Dark Green Fritillary (Argynnis aglaja L.), Scar Close NNR, Ingleborough*. 39pp. Unoublished report to the YDNPA, Grassington (Number 2695 Account 3802 / A500) Project SOl76), 34pp.

Whitaker, T.M. (2007) Current status of the Dark Green Fritillary (*Argynnis aglaja* L.) in Yorkshire, *The Naturalist* 131: 105-116.

Correction

to Archer (2013) Gains and losses of the *Andrena* and *Panurgus* mining bees (Hym., Andrenidae) in Watsonian Yorkshire – Naturalist 138: 188-191.

Chi-square tests when applied to data of less than 5 (comparison of columns '1900-1949' and '1950-1999 Adjusted' in Table 1) are not reliable for showing a significance difference. Therefore tests applied to *Andrena humilis*, *A. varians*, *A. labialis*, *A. thoracica* and *V. nigriceps* cannot be considered reliable. Nevertheless, for *A. humilis* and *A. nigriceps* the increase in the percentage change is so large that an increase in abundance can be considered.

MEA

Yorkshire Ichneumons: Part 2

W.A.Ely 9 Clifton Lane, Rotherham, South Yorkshire S65 2AA

Introduction

Following the publication of Part 1 (Ely, 2013a) there is now a context for reporting additions to the county and each vice-county and I take the opportunity to update the list.

† = new county record

* = new vice-county record

Subfamily **PIMPLINAE**

Tribe ***Ephialtini***

Scambus elegans (Woldstedt, 1877)

  *VC63: Soughley, Deepcar 29.3.2009 J.Flanagan

Scambus eucosmidarum (Perkins, 1957)

  *VC61: Skipwith Common NNR 27.8.2013 R.Crossley.

  *VC62: Strensall Common YWT NR 23.8.2013 R.Crossley.

Scambus signatus (Pfeffer, 1913)

  *VC65: Nosterfield NR 6.7.2013 W.A.Ely (Ely, 2013b p231).

Zaglyptus multicolor (Gravenhorst, 1829)

  *VC62: Flamingo Land 20.9.2013 W.A.Ely.

Clistopyga rufator Holmgren, 1856

  *VC61: North Cave Wetlands YWT NR 2-6.8.2013 R.Crossley.

Polysphincta rufipes Gravenhorst, 1829

  *VC61: North Cave Wetlands YWT NR 17.7.2013 R.Crossley.

Polysphincta vexator Fitton, Shaw & Gauld, 1988

  *VC61: Skipwith Common NNR 27.8.2013 R.Crossley.

Acrodactyla quadrisculpta (Gravenhorst, 1820)

  *VC61: East Cottingwith Ings 4.8.2013 R.Crossley.

Tribe ***Pimplini***

Itoplectis alternans (Gravenhorst, 1829)

Unconfirmed reports from VC62 by Hincks & Dibb (1940 p175) and Walsh & Rimington (1956 p277) and from VC63 by Morley (1908 p106-7), Carr (1914 p94), Anon (1914 p31) and Coldwell (1999 p61). Recorded from VC61 by Mayhew *et al.* (2009 p18), from VC63 by Ely (1992 p11, 2000 p46) and from VC64 by Hincks & Dibb (1940 p175) and Mayhew *et al.* (2009 p18).

  *VC62: Malton Road, York 20.5.1944 J.H.Elliott.

  *VC65: Colsterdale 27.6.1981 W.A.Ely.

Itoplectis aterrima Jussila, 1965

Recorded from VC63 by Ely (1992 p11, 2000 p46).

  *VC62: Strensall Common 3.7.2012 R.Crossley.

  *VC65: Witton Fell 27.5-29.8.1963 [E.Broadhead may have been the collector].

Itoplectis clavicornis (Thomson, 1889)

Unconfirmed report from VC61 by Morley (1908 p109). Recorded from VC63 by Ely (2000 p46).

Itoplectis maculator (Fabricius, 1775)

Unconfirmed reports from VC62 by Roebuck (1877 p39, 1907 p215), Morley (1908 p105) and Walsh & Rimington (1956 p276), from VC63 by Bairstow (1878 p20), Bairstow *et al.* (1882 p108), Roebuck (1907 p215), Morley (1908 p105) and Carr (1914 p94) and from VC64 by Bairstow *et al.* (1882 p108), Roebuck (1907 p215) and Morley (1908 p105). Recorded from VC61 by Hincks (1953 p135) and Mayhew *et al.* (2009 p18), from VC62 by Hincks (1943b p122), from VC63 by Hincks & Dibb (1940 p175), Ely (1992 p11) and Coldwell (1999 p61) and from VC64 by Hincks & Dibb (1940 p175), Ely (1987 p25) and Mayhew *et al.* (2009 p18).

*VC65: Witton Fell 29.8.1963 [E.Broadhead].

Itoplectis melanocephala (Gravenhorst, 1829)

†VC61: Sands Farm 7.6.1980 P.Skidmore.

*VC63: Kilnhurst Ings 19.7.2005 D.Whiteley.

Pimpla contemplator (Muller, 1776)

Unconfirmed reports from VC62 by Walsh & Rimington (1956 p276). Recorded from VC61 by Mayhew *et al.* (2009 p18), from VC63 by Ely (1992 p10) and Coldwell (1999 p61) and from VC64 by Ely (1987 p25) and Mayhew *et al.* (2009 p18).

*VC62: Strensall 11.7.1951 J.H.Elliott

*VC65: Thorpe Perrow Arboretum 17.7.1982 W.A.Ely.

Pimpla flavicoxis Thomson, 1877

This was found to be a mixture of two species, this one and the next (Shaw, 2006). Unconfirmed reports from VC61 by Hincks (1953 p135), from VC62 by Hincks & Dibb (1940 p175) and from VC63 by Ely (2000 p45). Recorded from VC61 by Mayhew *et al.* (2009 p19), from VC63 by Hincks & Dibb (1940 p175), Skidmore *et al.* (1987 p127) and Ely (1992 p11) and from VC64 by Hincks & Dibb (1940 p175) and Mayhew *et al.* (2009 p19).

*VC62: Malton Road, York 14.5.1944 + 15.6.1952 J.H.Elliott

*VC65: Colsterdale 30.8.1980 W.A.Ely.

Pimpla insignatoria Gravenhorst, 1829

Recorded from VC61 and VC62 by Mayhew *et al.* (2009 p19), from VC63 by Ely (1992 p11) and Coldwell (1999 p61) (both as *P. flavicoxis*) and from VC64 by Mayhew *et al.* (2009 p19).

*VC65: Hutton Conyers 2.10.2011 C.H.Fletcher.

Pimpla melanacria Perkins, 1941

Recorded from VC63 by Ely (2000 p47) and from VC64 by Ely (1986 p101) and Key (1987a p218, 375).

*VC62: Wass 2.6.1951 J.H.Elliott.

*VC65: Colsterdale 31.8.1980 W.A.Ely.

Pimpla rufipes (Miller, 1759)

Unconfirmed reports from VC61 by Morley (1908 p94-5) and Hincks (1953 p135), from VC62 by Roebuck (1877 p39, 1907 p215), Morley (1908 p94-5) and Walsh & Rimington (1956 p276), from VC63 by Bairstow (1878 p70), Roebuck (1907 p215), Morley (1908 p94-5) and Butterfield (1937 p47) and from VC64 by Roebuck (1907 p215) and Morley (1908 p94-5). Recorded from VC61 by Mayhew *et al.* (2009 p19), from VC63 by Ely (1992 p11), Coldwell (1999) p61) and Skidmore (2006 p148) and from VC64 by Ely (1987 p25) and Mayhew *et al.* (2009 p19).

*VC62: Malton Road, York 30.4.1944 J.H.Elliott.

*VC65: Wath Urn Bridge, Aldbrough St John 3.9.2012 W.A.Ely.

Pimpla spuria Gravenhorst, 1829

Recorded from VC63 by Ely (1992 p11, 2000 p47).

*VC62: Coatham, Redcar 7.8.2011 W.A.Ely.

*VC65: Middleton-in-Teesdale 12.6.1981 W.A.Ely.

Pimpla turionellae (Linnaeus, 1758)

Unconfirmed reports from VC61 by Carr (1914 p94), from VC62 by Roebuck (1877 p39, 1907 p215), Bairstow *et al.* (1882 p108) and Walsh & Rimington (1956 p276), from VC63 by Carr (1914 p94) and from VC64 by Bairstow *et al.* (1882 p108), Roebuck (1907 p215) and Morley (1908 p102-3). Recorded from VC61 by Fordham (1919 p16, 1940 p(ix)) and Mayhew *et al.* (2009 p19), from VC63 by Ely (1992 p11) and from VC64 by Mayhew *et al.* (2009 p19).

*VC62: N.Yorkshire ex *Euproctis similis* 9.1930 A.Smith.

*VC65: Freeholders' Wood, Aysgarth 15.6.1985 W.A.Ely.

Pimpla wilchristi Fitton, Shaw & Gauld, 1988

Recorded from VC65 by Ely (2011a p69, 2011b p222).

*VC64: Tosside & High Bentham 12.6.2014 W.A.Ely

Apechthis compunctor (Linnaeus, 1758)

Unconfirmed reports from VC62 by Walsh & Rimington (1956 p276). Recorded from VC63 by Ely (1992 p11) and Skidmore (2006 p148) and from VC64 by Mayhew *et al.* (2009 p19).

*VC61: Allerthorpe 1.7.1945 J.H.Elliott.

*VC62: Malton Road, York 23.5.1943 J.H.Elliott.

Apechthis quadridentata (Thomson, 1877)

Recorded from VC61 and VC64 by Mayhew *et al.* (2009 p19).

*VC62: Malton Road, York 13.5.1944 J.H.Elliott.

*VC63: Holmehouse Wood 16.8.1942 J.Wood.

*VC65: Birk Gill, Colsterdale 7.7.1984 A.Norris.

Apechthis rufata (Gmelin, 1790)

Unconfirmed reports from VC62 by Bairstow & Wilson (1882 p108), Roebuck (1907 p215) and Morley (1908 p102-3) and from VC63 and VC64 by by Bairstow *et al.* (1882 p108), Roebuck (1907 p215) and Morley (1908 p110). Recorded from VC61 by Mayhew *et al.* (2009 p19), from VC63 by Hincks & Dibb (1940 p175) and Ely (1992 p11) and from VC64 by Mayhew *et al.* (2009 p19).

*VC62: Malton Road, York 16.6.1943 A.Smith.

Tribe **Delomeristini**

Delomerista mandibularis (Gravenhorst, 1829)

Recorded from VC63 by Ely (1992 p11).

*VC61: Allerthorpe 25.5.1952 J.H.Elliott.

Delomerista novita (Cresson, 1870)

Recorded from VC61 by Mayhew *et al.* (2009 p13) and from VC63 by Ely (2000 p47).

*VC62: Cawthorne 26.9.1990 A.Grayson.

*VC64: Scar Close NNR 16.6.2010 T.M.Whitaker.

Perithous albicinctus (Gravenhorst, 1829)

Recorded from VC61 by Shaw (2006 p219) and Mayhew *et al.* (2009 p13).

*VC63: Keighley 6.9.2007 S.M.Saxton.

Perithous divinator (Rossius, 1790)

Recorded from VC63 by Butterfield (1908 p710) and Morley (1908 p47) and from VC64 by

Plate I. The 'Dinosaur Coast' and its fossils (see pp 102-3).

Top: Looking south at Saltwick Bay, near Whitby.

Above left: Ammonite *Hildoceras lusitanicum* collected from Saltwick Bay. Scale bar measures 4 cm.

Above right: A large block of belemnites collected from Saltwick Bay. They represent at least two different species and may be the result of a mass death event. Scale bar measures 10 cm.

Plate II. Dolichopodid flies (see pp 108-112).

Top left: *Dolichopus migrans* showing the typically laterally collapsed body that often happens with a teneral specimen on drying.

Top right: *Liancalus virens*. The fly is resting typically on a wet vertical surface. The supposed 'signalling' white spots at the apex of the male wings show clearly.

Above left: *Poecilobothrus nobilitatus* on a water surface also showing 'signalling' spots at their wing tips (mentioned in the text). East Yorkshire.

Above right: *Argyra diaphana* is not named in the paper, but it is a common dolichopodid and shows a silvery-dusted abdomen.

Left: *Rhaphium appendiculatum,* a common dolichopodid similar to *R.albomaculatum* mentioned on p109.

Photos: *I. Andrews*

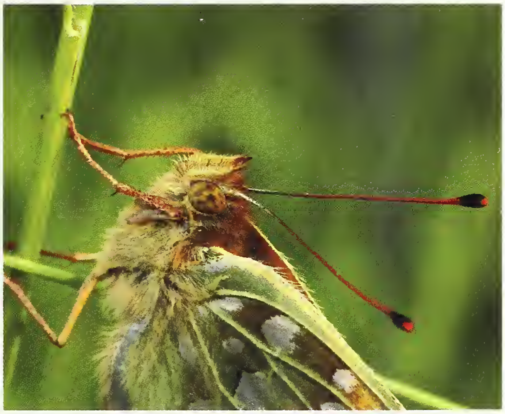


Plate III. Changes in the Dales population of Dark Green Fritillary (see pp 112-117 and front cover).

Top: Ingleborough from Scar Close NNR - these limestone pavement areas are favoured by the butterfly. *T. Whitaker*

Above left: A mating pair of Dark Green Fritillary showing the characteristic green underwings. *P. Brothers*

Above right: Close-up of the head showing the labial palps and the proboscis coiled between them among the hairs. *P. Brothers*

Plate IV. Plants of the Pocklington Canal (see pp 129-140).

Top left: Common Reed occupying 100% of the channel downstream of Coat's Bridge.

Top right: Botanical diversity in the non-navigable canal downstream of the restored Coat's Lock.

Above left: Cattle-poached margin on the landward side of Reed Sweet-grass and Yellow Water-lily downstream of Swing-bridge No. 1.

Above right: Luxuriant submerged/floating-leaved vegetation in the navigable channel up-stream of Hagg Bridge includes Arrowhead, Unbranched Bur-reed and Yellow Water-lily.

Photos: *R. Goulder*

Morley (1918 p398) and Fordham (1920 p181).

*VC61: Barmby Moor 30.5.1930 W.J.Fordham.

Perithous scurra (Panzer, 1804)

Unconfirmed report from VC61 by Morley (1908 p47). Recorded from VC61 by Hincks (1953 p135), from VC62 by Walsh & Rimington (1956 p276) and from VC63 by Ely (1992 p12) and Coldwell (1999 p61).

*VC64: Temple Newsam, Leeds 1977 P.Skidmore.

Perithous septemcinctorius (Thunberg, 1822)

Unconfirmed reports from VC64 by Bairstow *et al.* (1882 p108), Roebuck (1907 p215) and Morley (1908 p48). Recorded from VC61 by Shaw (2006) p219 and Mayhew *et al.* (2009 p13).

Subfamily **POEMENIINAE**

This was treated as a tribe of the Pimplinae by Fitton *et al.* (1988).

Poemia collaris Haupt, 1917

Recorded from VC61 and VC64 by Shaw (2006) p219 and Mayhew *et al.* (2009 p20).

Poemia hectica (Gravenhorst, 1829)

Recorded from VC61, VC62 and VC64 by Shaw (2006) p219 and Mayhew *et al.* (2009 p20).

Poemia notata Holmgren, 1859

Recorded from VC61 by Shaw (2006) p219 and Mayhew *et al.* (2009 p20).

*VC64: Lower Dunsforth Church 3.7.2011 W.A.Ely.

Deuteroxorides elevator (Panzer, 1799)

Recorded from VC61 by Shaw (2006) p219 and Mayhew *et al.* (2009 p20), from VC63 by Ely (2000 p47) and from VC64 by Shaw (2006) p219 and Mayhew *et al.* (2009 p20).

Subfamily **RHYSSINAE**

This was treated as a tribe of the Pimplinae by Fitton *et al.* (1988).

Rhyssa persuasoria (Linnaeus, 1758)

Unconfirmed reports from VC61 by Morley (1908 p27-8) and Fordham (1940 p(xi)), from VC62 by Waddington (1901 p296), Roebuck (1907 p215), Morley (1908 p27-8) and Hincks & Dibb (1940 p175), from VC63 by Roebuck (1907 p215), Morley (1908 p27-8), Bayford (1947) and Hincks (1948 p38) and from VC64 by Stephens (1867 p2), Roebuck (1878 p66; 1907 p215), Morley (1908 p27-8) and Butterfield (1932 p59). Recorded from VC62 by Hincks (1945 p14) and Walsh & Rimington (1956 p276), from VC63 by Ely (1992 p12, 2000 p47) and Coldwell (1999 p61) and from VC64 by Hincks (1948 p38).

*VC61: Skipwith Common 16.7.1994 A.Grayson.

*VC65: Foxglove Covert NR 20-21.7.2013 E.Dickinson.

Rhyssella approximator (Fabricius, 1793)

Recorded from VC63 by Ely (1992 p12, 2000 p47) and from VC64 by Ely (1987 p25).

Subfamily **DIACRITINAE**

This was treated as a tribe of the Pimplinae by Fitton *et al.* (1988).

Diacritus aciculatus (Vollenhoven, 1878)

Recorded from VC61 and VC62 by Mayhew *et al.* (2009 p8-9), from VC63 by Key (1987b p288) and Ely (1992 p11), from VC64 by Mayhew *et al.* (2009 p8-9) and from VC65 by Hincks (1943a p59).

References

Anon (1914) A Year's Scientific Work in Yorkshire. *The Naturalist* 39: 31

Bairstow, S.D. (1878) Yorkshire Ichneumonidae and Braconidae for 1878. *Yorkshire Naturalists' Union Transactions 1878*

Bairstow, S.D., Roebuck, W.D. & Wilson, T. (1882) Yorkshire Hymenoptera: Third List of Species. *Yorkshire Naturalists' Union Transactions 1880*

Bayford, E.G. (1947) *Rhyssa persuasoria* L. near Barnsley. *The Naturalist* 72

Butterfield, R. (1908) Natural History Observations in the Bradford District - Hymenoptera. *Bradford Scientific Journal* 15, 2: 70-1

Butterfield, R. (1932) Hymenoptera. *in* Anon: The Yorkshire Naturalists' Union's Seventieth Annual Report, for 1931. *The Naturalist* 57: 59

Butterfield, R. (1937) Hymenoptera *in* Anon: The Yorkshire Naturalists' Union's Seventy-fifth Annual Report, for 1936. *The Naturalist* 62: 47

Carr, J.W. (1914) Ichneumonidae from Yorkshire & Lincolnshire. *The Naturalist* 39: 94.

Coldwell, J.D. (1999) Insects of the Barnsley Area. *Sorby Record Special Series* 12.

Ely, W.A. (1986) Entomology *in* Yorkshire Naturalists' Union Excursions in 1985. Acaster Malbis (VC64). *The Naturalist* 111: 101

Ely, W.A. (1987) The Pimplinae (Hymenoptera, Ichneumonidae) of Askham Bog. *YNU Bulletin* 8,: 23-5.

Ely, W.A. (1992) The Ichneumons of South Yorkshire. 1. Pimplinae. *Sorby Record* 28: 7-13.

Ely, W.A. (2000) Ichneumons of the Sorby Area: Update on Pimplinae. *Sorby Record* 36: 44-48.

Ely, W.A. (2011a) Ichneumons *in* Henderson, A. & Norris, A. Yorkshire Naturalist's Union Excursions in 2010. Ballowfield LNR (VC65) 7 August 2010. *The Naturalist* 1076: 69.

Ely, W.A. (2011b) Hymenoptera – Parasitica *in* Henderson, A. & Norris, A. Yorkshire Naturalist's Union Excursions in 2011. Gunnerside & Low Row (VC65) 13 August 2011. *The Naturalist* 136: 222.

Ely, W.A. (2013a) Yorkshire Ichneumons Part 1. *The Naturalist* 138: 180-7.

Ely, W.A. (2013b) Insects - Parasitic Hymenoptera *in* Henderson, A. & Norris, A. Yorkshire Naturalists' Union Excursions in 2013. Nosterfield NR (VC65) 6 July 2013. *The Naturalist* 138: 231

Fitton, M.G., Shaw, M.R. & Gauld, I.D. (1988) Pimpline Ichneumon-flies. *Handbooks for the Identification of British Insects* Vol 7, Part 1.

Fordham, W.J. (1919) Notes on the Entomology of the Bubwith District. *The Naturalist* 44: 13-6, 70..

Fordham, W.J. (1920) New and Interesting Yorks. Hymenoptera. *The Naturalist* 45: 181-2.

Fordham, W.J. (1940) Entomology *in* Circular No. 425. *The Naturalist* 65: xi.

Hincks, W.D. (1943a) Additions to the List of Yorkshire Hymenoptera. *The Naturalist* 68: 56-9.

Hincks, W.D (1943b) Coleoptera and Other Orders *in* Anon Yorkshire Naturalists at Scarborough. *The Naturalist* 68: 122-3.

Hincks, W.D. (1945) Hymenoptera *in* Yorkshire Naturalists' Union Excursions in 1945. Wykeham, June 6th. *The Naturalist* 70: 140-1.

Hincks, W.D. (1948) Hymenoptera *in* The Yorkshire Naturalists' Union Eighty-sixth Annual Report. *The Naturalist* 73: 38.

Hincks, W.D. (1953) X. Hymenoptera excluding Aculeata. *in* Anon The Entomology of Spurn Peninsula. *The Naturalist* 78: 129-39.

Hincks, W.D. & Dibb, J.R. (1940) Some Northern records of Ichneumonidae. *The Naturalist* 65: 173-6.

Key, R. (1987a) *Invertebrate Site Register Report 79II - North Yorkshire - West*. NCC, Peterborough.

Key, R. (1987b) *Invertebrate Site Register Report 78II - North Yorkshire - Central.* NCC, Peterborough.

Mayhew, P.J., Dytham, C., Shaw, M.R. & Fraser, S.E.M. (2009) Collections of ichneumonid wasps (subfamilies Diacritinae, Diplazontinae, Pimplinae and Poemeniinae) from woodlands near York and their implications for conservation planning. *The Naturalist* 134: 3-24.

Morley, B. (1918) Yorkshire Naturalists' Union: Entomological Section. *The Naturalist* 43: 398-9.

Morley, C. (1908) *Ichneumonologia Britannica. The Ichneumons of Great Britain. III. Pimplinae.* Brown, London.
Roebuck, W.D. (1877) Yorkshire Hymenoptera. *Transactions of the Yorkshire Naturalists' Union* 1877
Roebuck, W.D. (1878) Yorkshire Hymenoptera in 1878. *Transactions of the Yorkshire Naturalists' Union* 1878
Roebuck, W.D. (1907) Hymenoptera. *in* Page, W *A History of Yorkshire Vol 1*. Constable & Co., London
Shaw, M.R. (2006) Notes on British Pimplinae and Poemeniinae (Hymenoptera, Ichneumonidae), with additions to the British List. *British Journal of Entomology & Natural History* 19: 217-38.
Skidmore, P. (2006) An Inventory of the Invertebrates of Thorne and Hatfield Moors. *Thorne and Hatfield Moors Monograph* 2.
Stephens, J.F. (1867) Illustrations of British Entomology. Supplement. Bohn, London
Roebuck, W.D. (1878) Yorkshire Hymenoptera in 1878. *Transactions of the Yorkshire Naturalists' Union* 1878
Walsh, G.B. & Rimington, E. (1956) *Natural History of the Scarborough District*. Scarborough Field Naturalists' Society.
Waddington, J. (1901) Yorkshire Naturalists at Wykeham, near Scarborough. *The Naturalist* 26: 296.

State of aculeate Hymenoptera in Watsonian Yorkshire: species gains and losses

M. E. Archer
Email: marcher756@btinternet.com

With the development of electronic databases it is now possible quickly to access data showing the gains and losses of aculeate Hymenoptera in Watsonian Yorkshire. Originally this study was concerned with the number of records per species from the first and second fifty years of the 20th century (Archer, 2013b) but can now be extended to records from the 19th and 21st centuries (to 2013). The aim of this paper is to assess the gains and losses of aculeates with particular reference to the period from 1950 onwards.

Method

All the data required were obtained from the Yorkshire database, from the earliest records in the 19th century (Archer, 2011) until 2013. As the recorder for the aculeate Hymenoptera I am grateful for the many records provided by naturalists past and present (Archer, 2002, 2011).

Results

Table 1 shows the number of aculeate Hymenoptera that have been recorded in Yorkshire. Just over 20% (21.7%) were first recorded from 1950 onwards. Five species have been excluded from this table because three (*Tiphia femorata*, *Eumenes papillarius* and *Andrena falsifica* are vagrants and two (*Monomorium pharaonis* and *Hypoponera punctatissima* are only found in heated buildings.

Table 1. The number of aculeate Hymenoptera species recorded in Yorkshire with the number of gains and losses from 1950 onwards and losses from pre-1950.

	Total no. spp.	No. spp. 1950 onwards		Losses pre-1950
		Gains	Gains now lost	
DEB species				
Dryinidae	23	11	0	0
Embolemidae	1	1	0	0
Bethylidae	4	1	0	0
Total DEB spp.	28	13	0	0
Solitary wasps				
Chrysididae	17	1	0	2
Tiphiidae	2	1	0	0
Mutillidae	2	0	0	0
Sapygidae	2	0	0	0
Pompilidae	25	8	1	0
Eumeninae	12	0	2	1
Sphecidae	2	1	1	0
Crabronidae	78	20	2	1
Total Solitary wasps	140	31	6	4
Solitary bees				
Colletidae	10	4	0	0
Andrenidae	36	6	3	1
Halictidae	32	7	2	2
Melittidae	1	1	1	0
Megachilidae	16	3	0	0
Apidae	21	3	0	0
Total Solitary bees	116	24	6	3
Social species				
Formicidae	18	2	0	3
Vespinae	9	2	0	0
Apidae	25	1	6	1
Total Social species	52	5	6	4
Total aculeate species	336	73	18	11

Twenty-three of the 336 species (Table 1) are now considered extinct in Yorkshire either because of recent dramatic declines or because current British distributions have withdrawn southwards (Table 2A). A further six may or may not be extinct in Yorkshire either because they are near the northern edge of their English distribution or are rare in Britain (Table 2B). The difficulty of knowing whether a species may be extinct or not is because there may be a long period of years between the recordings of a species (Table 3).

Table 2A. Extinct species with last recorded year and reason for accepting extinction.

	Last recorded year	Reason for extinction
Ceropales maculata (Fab)	1950	Rapid decline
Ancistrocerus antilope (Panzer)	1973	Rapid decline
Ancistrocerus nigerrimus (Curtis)	1955	Rapid decline northern England
Symmorphus crassicornis (Panzer)	1932	Rapid decline
Podalonia affinis (Kirby)	1974	Only Yorkshire site destroyed
Ectemnius lituratus (Panzer)	1852	North of current distribution
Mimesa bicolor (Jurine)	1979	Declined
Mellinus crabroneus (Thunberg)	1952	Rapid decline
Andrena labiata Fab.	1945	North of current distribution
Andrena pilipes Fab.	1950	North of current distribution
Andrena thoracica (Fab.)	1981	North of current distribution
Panurgus banksianus (Kirby)	1987	North of current distribution
Lasioglossum laevigatum (Kirby)	1966	North of current distribution
Sphecodes miniatus von Hagens	1951	North of current distribution
Melitta leporina (Panzer)	1980	North of current distribution
Lasius fulginosus (Latreille)	1928	North of current distribution
Bombus distinguendus Morawitz	1974	Rapid decline
Bombus humilis Illiger	1988	North of current distribution
Bombus ruderarius (Müller)	1987	Rapid decline
Bombus ruderatus (Fab.)	1954	North of current distribution
Bombus soroeensis (Fab.)	1975	Outside British distribution
Bombus subterraneus (Linn.)	1935	Rapid decline
Bombus sylvarum (Linn.)	1951	Rapid decline

Table 2B. Other species that could be extinct with last recorded year.

	Last recorded year	Reason for extinction
Chrysis mediata Lisenmaier	1946	Near northern edge of current distribution
Cleptes nitidulus (Fab.)	1850	Near northern edge of current distribution
Lasioglossum quadrinotatum (Kirby)	1935	Near northern edge of current distribution
Lasioglossum parvulum (Schenck)	1907	Near northern edge of current distribution
Lasius mixtus (Nylander)	1937	Rare in northern England
Lasius umbratus (Nylander)	1937	Rare in northern England

Table 1 also shows that 18 of the 73 species gained from 1950 onwards are now extinct (losses) (Table 1, 2A). A further 11 were only recorded pre-1950, listed in Table 1 as 'Losses pre-1950', with five of them considered extinct (Table 2A) and the other six (Table 2B) could be extinct. Fig. 1 shows the gains per decade from 1950 until 2009 and from 2010 until 2013. The gains are particularly noticeable between the 1970s and 2000s. Overall the 55 species gained from 1950 onwards exceed the total losses of 29 species (Table 1). The losses of bumblebees (7 species, 29% loss) and the gains of dryinids, embolemiids and bethylids (DEB species - 14 species, 50%

gain) are particularly noticeable.

Table 3. Species with long period of years between recordings

	Dates when recorded
Omalus aeneus (Fab.)	1907:1977
Sapyga claviventris (Linn.)	1852:1956
Andrena humilis Imhoff	1914:1971
Andrena nitida (Müller)	1840:2002
Lasioglossum lativentre (Schenck)	1927:2006
Lasioglossum leucozonium (Schrank)	1908:1983
Lasioglossum morio (Fab.)	1936:2000
Nomada obtusifrons Nylander	1918:1975
Nomada integra Brullé	1922:1973
Melecta albifrons (Forster)	1922:1997

Fig.1 The number of new species recorded in Yorkshire per decade from 1950 until 2009 and from 2010 until 2013.

Discussion

The recorded gains from 1950 onwards (Table 1) were mainly due to the activities of three persons: M.E. Archer, J.T. Burn and W.A. Ely. These three found or identified many of the new species including the following which are still only known by single records: *Gonatopus distinguendus*, *Bethylus dendrophilus*, *Priocnemis hyalinata*, *P. cordivalvata*, Two-coloured Mimic Wasp *Mimesa bicolor* and *Lasioglossum pauxillum*. These three persons also developed skills so that they could identify the records of several other recorders of the gain species. Through the recording and educational activities of the Bees, Wasps and Ants Recording Society (www.bwars.com) at least 14 of the gain species (e.g. Bee Wolf *Philanthus triangulum*, *Nomada flava*, *Dolichovespula media and* Tree Bumblebee *Bombus hypnorum*) were gained due to a northward increase of their English ranges. The reasons for this northwards dispersal are not known but generally are believed to be related to more favourable weather, particularly during the 1990s and early 2000s (Brohan *et al.*, 2006; Jones & Moberg, 2003), resulting in an increased movement of insects (Unwin & Corbet, 1991). Archer (2013a) was able to show that the first

recordings of solitary aculeates in a Leicester suburban garden could be related to higher temperature, increased sunshine and decreased rainfall.

The loss of bumblebees has been related to the loss of habitat due to intensive arable farming, resulting in the removal of hedgerows, increased drainage and the use of pesticides (Goulson, 2010; Benton, 2006). These changes would result in the loss of nesting sites and the interruption of the insects' continuous need for flowers for pollen and nectar resources from April until September.

The reasons for the losses of solitary aculeates are generally unknown except for the Mud Wasp *Podalonia affinis* whose nesting sites in a sand quarry were removed. Often the loss can be related to a general British decline sometimes leading to extinction (e.g. *Ancistrocerus antilope* and the Sand Digger Wasp *Mellinus crabroneus*) or a loss from northern England (e.g. the potter wasps *Ancistrocerus nigricornis* and *Symmorphus crassicornis)*.

The ants have been less investigated in comparison with other aculeate groups so that *Lasius mixtus* and *L. umbratus* may still be present in Yorkshire, but some directed study will be necessary to establish this. A recent study by E. Robinson (pers. comm., 2013) has re-established the presence of the Shining Guest Ant *Formicoxenus nitidulus* in the nests of the Hairy Wood Ant *Formica lugubris* on the North York Moors.

Summary

To 2013, 336 aculeates have been recorded in Watsonian Yorkshire, of which 73 species were first recorded from 1950 onwards. Additionally three vagrants and two species restricted to heated buildings have also been recorded. Twenty-three aculeates are now considered extinct in Yorkshire, including 18 recorded from 1950 onwards and five first recorded prior to 1950. A further six first recorded prior to 1950 may also be extinct. Some explanations are suggested for the species gains from 1950 onwards and for the extinctions.

References

Archer, M.E. (2002) *The Wasps, Ants and Bees of Watsonian Yorkshire.* YNU, York.

Archer, M.E. (2011) *People, Places and Species – a History of the Study of Wasps, Ants and Bees in Watsonian Yorkshire.* Vespid Studies, York.

Archer, M.E. (2013a) The solitary wasps and bees (Hymenoptera, Aculeata) of a suburban garden in Leicester, England, over 27 years. *Entomologist's Monthly Magazine* 2013: 93-121.

Archer, M.E. (2013b) Gains and losses of the *Andrena* and *Panurgus* mining bees (Hym., Andrenidae) in Watsonian Yorkshire. *The Naturalist* 138: 188-191.

Benton, T. (2006) *Bumblebees*. HarperCollins, London.

Brohan, P., Kennedy, J.J., Harris, S.F.B. & Jones, P.D. (2006) Uncertainty estimates in regional and global observed temperature changes: A new set from 1860. *Journal of Geographical Research* 111: D12106, doi 10.1029/2005JD006548.

Goulson, D. (2010) *Bumblebees: behaviour, ecology and conservation.* Oxford University Press, Oxford.

Jones, P.D. & Moberg, A. (2003) Hemispheric and Large-Scale surface air temperature variations: an extensive revision and an update to 2001. *Journal of Climate* 16: 206-223.

Unwin, D.M. & Corbet, S.A. (1991) Insects, plants and microclimate. *Naturalist Handbooks* 15: 1-68.

Obituary: Helen Margaret Jackson B.A. 1930-2013

Helen was born in Bradford and, following her education at Bingley Grammar School, gained a B.A. in English at Manchester University. She moved to Harrogate in 1953 and taught English at all levels at Harrogate Grammar School until her retirement.

She joined the Harrogate and District Naturalists' Society in 1961 and soon became involved in its organization, becoming Programme Secretary in 1968, arranging winter lectures for 35 years and was also involved in organizing and leading summer field outings. In 1991 she became Editor of the Society's Annual Report, continuing in that post until 2007 when she produced the 60th Anniversary edition. She was made an Honorary Life Member of the Society in 2005.

Helen was a keen and proficient botanist, taking part in many recording schemes, one of the most important being for the Botanical Atlas of the Harrogate District, compiled by W.H. Jowsey and published in 1978. A lifetime interest in birds ran alongside her botanical pursuits and she was a keen member of the British Trust for Ornithology, taking part in its surveys and regularly attending its annual November conferences at Swanwick in Derbyshire. During the 1960s and 70s, together with her friend the late Margaret Sanderson, she undertook a long-term survey of breeding Nightjars *Caprimulgus europaeus* on Sawley High Moor near Brimham Rocks and also on Thorne Moors. In the 1980s she went on to develop a keen interest in moth trapping.

Her most active involvement was with the Yorkshire Naturalist Trust (now Yorkshire Wildlife Trust), being elected as a trustee in October 1985 and serving without a break until 2008. She became a member of the Trust's Nature Reserves Committee also in 1985 and became its Chairman from 1992 until such voluntary positions were taken over by professional staff in 2001. She was Secretary of the Trust's Yorkshire Dales Regional Committee from 1988 to 2006, promoting the Trust's work in that area, and was also Chairman of the Burton Leonard Lime Quarries Reserve's Management Committee. Elected to the Vice Presidency of the Trust in 2001, she remained in that office until 2008.

Her involvement with the Yorkshire Naturalists' Union, which she joined in 1985, ran parallel to her interests in other organizations. She was particularly interested in the Botanical Section and regularly attended the Union's Natural Sciences Committee meetings. She was elected to serve as the Union's President in 2005, her Presidential address *Some aspects of natural history and conservation in Yorkshire* being delivered at the Spa Hotel, Ripon, on 25th November 2006.

Her very quiet, unassuming personality concealed a hard-working tenacity for whatever project she undertook, as evidenced by her long periods of office in important roles. Helen died peacefully after a long stay in Heath Lodge Residential Home, Harrogate, and her cremation took place at Stonefall Crematorium, Harrogate, on 14th October 2013. With her passing, Yorkshire lost one of its most committed all-round naturalists and conservationists.

See also YNU Bulletin 45, 2006 pp 46-47.

JRM

Aquatic plants in the Pocklington Canal: a decade of change

R. Goulder 5 Bishops Croft, Beverley HU17 8JY
Email: r.goulder@hull.ac.uk

Introduction

The Pocklington Canal in East Yorkshire was opened throughout to navigation in 1818; it had a length of 14.8km and descended from Canal Head at 1.5km south of Pocklington through nine locks to join the River Derwent at Cottingwith. Commercial navigation came to an end in the 1930s and the whole canal fell into dereliction. The voluntary Pocklington Canal Amenity Society (PCAS), with support from diverse statutory bodies, has worked towards the restoration of the canal for leisure navigation since about 1970. By 1987 dredging and the restoration of locks and bridges allowed navigation from Cottingwith to Melbourne along 8.3km of canal. Beyond Melbourne the canal remains derelict, although four of the seven locks between Melbourne and Canal Head have been restored (Anon, 2008a). The 6.5km of derelict canal between Thornton Lock at Melbourne and Canal Head is regarded as having high nature conservation status. This length of canal was notified as a SSSI in 1987, in part because of its diverse aquatic flora that included several nationally scarce plants (Anon, 2013b) but by 2010 the condition of the SSSI was judged to be unfavourable and deteriorating, largely because of a decrease in plant diversity (Anon, 2013b).

The aims of the study described in this article were: (1) to compare the current (2013) aquatic flora of the non-navigable (SSSI) canal between Pocklington and Melbourne with that of the navigable canal between Melbourne and Cottingwith; (2) to examine change in aquatic flora over the past decade by comparison of records made in 2002 with those of 2013. These aims were achieved, firstly by recording the emergent, floating-leaved and submerged aquatic plants along six 500m lengths of the non-navigable canal and six 500m lengths of the navigable canal in summer 2013, and secondly by comparison of these records with those from a 2002 study that was carried out by the same recorder at the same sites and using identical methods (Goulder, 2003).

Materials and Methods

Aquatic plants were recorded in July 2013. The lengths surveyed on the non-navigable canal were:

(1 & 2) 0-500m downstream of Canal Head (SE800473) and 500-1000m downstream of Canal Head;

(3 & 4) 0-500m upstream of Coat's Bridge (SE785452, c.2.8km from Canal Head) and 0-500m downstream of Coat's Bridge;

(5 & 6) 0-500m upstream of Walbut Bridge (SE771442, 5.6km from Canal Head) and 0-500m downstream of Walbut Bridge.

Those on the navigable canal were:

(7 & 8) 0-500m upstream of Swing-bridge No. 6 (SE747445, 8.0km from Canal Head) and 0-500m downstream of Swing-bridge No. 6;

(9 & 10) 0-500m upstream of Hagg Bridge (SE717451, 11.5km from Canal Head) and 0-500m downstream of Hagg Bridge;

(11 & 12) 0-500m upstream of Swing-bridge No. 1 (SE711440, 13.1 km from Canal Head) and 0-500m downstream of Swing-bridge No. 1.

Aquatic plants in 500m lengths of canal were recorded from the towing path by eye, which was generally facilitated by clear water, and by means of at least 20 grapnel hauls. Emergent plants on the far side were, when necessary, identified using binoculars. A checklist was used when recording: i.e. those plants listed by Palmer & Newbold (1983) as aquatic plants found in England and Wales plus stoneworts, Greater Water-moss[5] and all species of rushes. The abundance of each plant was recorded on a three point scale (Holmes, 1983):

1 = <0.1% whole-channel cover;
2 = 0.1-5% cover;
3 = > 5% cover .

The sum of the abundance scores of the plants recorded in each 500m length (∑A) was used as an approximate indicator of both species richness and abundance. In addition the hierarchical richness index (HRI) (French, 1994) was calculated for each 500m length. This is a relative measure that aims to combine both species richness and species abundance to give a combined indicator of both variety and abundance. It has previously been used, for example, to describe the flora of hedgerows (French & Cummins, 2001). Nomenclature follows Stace (2010).

Aquatic plants in 2013

The non-navigable canal

The lengths of non-navigable canal surveyed between Canal Head and Melbourne were largely dominated by emergent vegetation. This generally formed wide marginal stands and had often spread to occupy all or most of the width of the canal, with open water reduced to a narrow channel often sinuous and, in places, indiscernible or less than 1m wide and no more than 20cm deep. The emergent vegetation was often a more or less pure stand of either Reed Sweet-grass or Common Reed while Branched Bur-reed and Bulrush were in places conspicuous although much less abundant. Submerged and floating-leaved plants generally occupied a lesser area than the emergent vegetation, although the floating leaves of Yellow Water-lily were dominant where a several metres wide central channel persisted, most notably in Length 5, upstream of Walbut Lock. Furthermore, grapnel hauls from the central channel frequently yielded Canadian and/or Nuttall's Waterweeds while Common and Ivy-leaved Duckweeds were often conspicuous amongst emergent plants and wherever open water remained.

There were exceptions to the dominance of emergent vegetation in the non-navigable canal. For example:

(1) the initial 190m from Canal Head to Top Lock was largely open water with extensive patches of Curled and Fennel Pondweeds and Fan-leaved Water-crowfoot;

(2) areas of deep and open water associated with the restored Coat's Lock and Walbut Lock (Lengths 3 & 5) supported diverse communities that included both submerged/floating-leaved and emergent plants. Hence, over c.20m of canal that receives by-flow water downstream of Coat's Lock there were the submerged/floating-leaved Canadian and Nuttall's Waterweeds, Common and Ivy-leaved Duckweeds, stonewort, Yellow Water-lily and Unbranched Bur-reed and emergent Reed Sweet-grass, Common Reed and Branched Bur-reed. In the c.15m of deep open

[5] Scientific names of all plants mentioned in the text are to be found in Tables 1 and 2.

water upstream of Walbut Lock submerged/floating leaved plants included Canadian Waterweed, Yellow Water-lily, Broad-leaved Pondweed and Unbranched Bur-reed and emergent ones included Flowering-rush, Reed Sweet-grass, Yellow Iris and Common Reed.

The navigable canal

The lengths of navigable canal that were surveyed between Melbourne and Cottingwith had a central channel, depth perhaps 80-120cm, and there were broad margins of emergent vegetation several metres wide, in places interrupted by tree shading. The central channel supported a luxuriant community of submerged/floating-leaved vegetation that frequently approached 100% cover. Reed Sweet-grass was much the most important emergent plant in the navigable canal, although Reed Canary-grass was conspicuous in places. Furthermore, more species of emergent plants were recorded in the navigable canal. This greater diversity was notable, for example: (1) Length 7 – probably the most intensively navigated length of canal because of regular weekend trips by the PCAS narrow boat *New Horizons* – where a diversity of emergent plants had colonized the interface between Reed Sweet-grass/Reed Canary-grass marginal vegetation and the open central channel. These included Fool's-water-cress, Lesser Water-parsnip, Flowering-rush, water-cress, Arrowhead, Branched Bur-reed and Bulrush; (2) Length 12 where there was grazing and poaching by cattle as far as they could reach outwards on the landward side of the Reed Sweet-grass marginal vegetation. Species here included Creeping Bent, Water-plantain, Fool's-water-cress, Lesser Water-parsnip, Flowering-rush, Common Spike-rush, Marsh Horsetail, Yellow Iris, Toad Rush, Soft-rush, Hard Rush, Water Mint, Tufted and Water Forget-me-nots, water-cress, Reed Canary-grass, Celery-leaved Buttercup, Arrowhead, Branched Bur-reed, Brooklime and Pink Water-speedwell.

The floating leaves of Yellow Water-lily were by far the most conspicuous component of the luxuriant vegetation of the open central channel of the navigable canal, often occupying the whole width of the channel. The leaves of Unbranched Bur-reed were frequently observed trailing on the water surface and were abundant in Length 9. Amongst submerged plants Nuttall's Waterweed was abundant, notably in Lengths 9-12, while Shining Pondweed was abundant in Lengths 9-11 and Flat-stalked Pondweed, which is nationally scarce, was recorded in Lengths 7-9, although few plants were present.

Quantitative comparison of non-navigable and navigable lengths of canal

The diversity of aquatic plants in the non-navigable canal between Canal Head and Melbourne in July 2013 was much less than in the navigable canal between Melbourne and Cottingwith. Altogether 47 plants were recorded, 27 in the non-navigable canal and 44 in the navigable canal (Tables 1 & 2). The mean number of species per 500m was significantly less in the non-navigable lengths of canal, i.e. 13.8 compared to 25.0 in navigable lengths ($P<0.05$) (Table 3). Likewise, the indicators of integrated species richness and abundance ($\sum A$ and HRI) were significantly less for non-navigable lengths: mean $\sum A = 24.8$ compared to 38.3 for navigable lengths and mean HRI = 158 compared to 396 for navigable lengths ($P<0.05$) (Table 3).

Thirty-one emergent plants were recorded: 16 in the non-navigable canal and 30 in the navigable canal (Tables 1 & 2). The mean number of species (8.0), mean $\sum A$ (13.5) and mean HRI (55.5) for emergent plants in non-navigable lengths of canal were all significantly less than in navigable lengths (16.8, 24.0 and 177 respectively) ($P<0.05$) (Table 3). Sixteen taxa of

submerged/floating-leaved plants were recorded: 11 in the non-navigable canal and 14 in the navigable canal (Tables 1 & 2). The mean number of taxa in non-navigable lengths (5.8) was significantly less than in navigable lengths (8.2) (P=0.05). Mean values of ∑A and HRI were numerically less for non-navigable lengths but were not significantly different from mean values for navigable lengths (P>0.05) (Table 3).

The complete data set from the July 2013 survey is given as electronic Appendices 1 and 2 on the YNU website at http://ynu.org.uk/node/440

Comparison of aquatic plants in 2002 and 2013

The non-navigable canal (see Plate IV, centre pages)

Sixteen emergent and 11 floating-leaved/submerged plants of the 37 recorded in the non-navigable canal in 2002 were still there in 2013 (Table 1). Ten of them were, however, not found in 2013: seven emergents (Water-plantain, Common Marsh-bedstraw, Soft-rush, Water Mint, Water Forget-me-not, water-cress and Celery-leaved Buttercup) and three submerged taxa (water-starwort, Greater Water-moss and Small Pondweed). The number of 500m lengths of canal in which each plant was recorded in 2002 and 2013 is given in Table 1; this allows assessment of increase or decrease in the range of each one. Amongst the plants that were not recorded in 2013, water-starwort had formerly been recorded in three 500m lengths, otherwise the missing taxa had previously been recorded in only one or two (out of six) 500m lengths. No new plants were recorded in the non-navigable canal in 2013.

The navigable canal (see Plate IV, centre pages)

33 aquatic plants were recorded in the navigable canal in 2002. All 22 emergents were still there in 2013 while all but one of the 11 submerged/floating-leaved plants also persisted (Table 2). The missing one was Fat Duckweed, which had been recorded in three out of six 500m lengths in 2002. Several of the emergent plants had markedly increased their ranges between 2002 and 2013 (Table 2). The number of 500m lengths with records had increased from one to three for Water-plantain and Yellow Iris, from two to six for water-cress, three to five for Amphibious Bistort and Bittersweet, one to five for Celery-leaved Buttercup, one to six for Arrowhead, three to six for Branched Bur-reed and two to four for Bulrush. Amongst submerged/floating-leaved plants there were apparently both decreases and increases in range. Thus the number of 500m lengths with Rigid Hornwort decreased from six to one, with stoneworts from five to one, with Flat-stalked Pondweed from six to three and with Fennel Pondweed from three to one. On the other hand, lengths with Canadian Waterweed increased from one to five.

Twelve plants were recorded in the navigable canal in 2013 that were not found there in 2002 (Table 2). Eight of these were emergents and of these Lesser Water-parsnip and Flowering-rush had colonized all six of the 500m lengths that were surveyed. Four were submerged/floating-leaved plants and Fan-leaved Water-crowfoot and Unbranched Bur-reed had colonized to the extent that they were recorded in three and five 500m lengths respectively. Nine plants had been previously recorded in non-navigable lengths in 2002 including eight of the 10 plants that have apparently been lost from the non-navigable canal since 2002 (Table 1). New to the canal in 2013 were Toad Rush, Tufted Forget-me-not and Pink Water-speedwell.

Discussion

The lesser floristic richness of aquatic plants in the non-navigable lengths of canal (shown by fewer species and lower values of $\sum A$ and HRI) (Table 3) and also the notable loss of species between 2002 and 2013 (Table 1), is likely to be a result of unchecked hydroseral succession. Continuing siltation and development of pure stands of Reed Sweet-grass or Common Reed, often across the whole width of the channel, have probably led to the out-competition of less robust plants. It is notable that much of the botanical interest in the non-navigable canal persisted at sites where there had clearly been disturbance that has checked succession, for example: (1) the 190m from Canal Head to Top Lock that continues as open water because it is periodically dredged to remove silt brought in by the feeder (this also enhances visual amenity at this visitor hot-spot and facilitates angling, there being constructed fishing stages along this section of canal); (2) areas of deep and open water created by the restoration of Coat's Lock and Walbut Lock.

The greater floristic richness in the navigable lengths of canal (Table 3) and colonization by additional species between 2002 and 2013 (Table 2) are likely to be related to greater habitat diversity. The navigable canal has both a deep central channel that is kept open by boat movements (Fig.1) and broad margins of emergent vegetation, a pattern that will have developed following dredging during canal restoration. There has also been occasional use of a weed-cutting boat.

Figure 1. A typical leisure boat using the Pocklington Canal.

An especially favourable habitat for emergent species in the navigable canal tends to be found at the interface between the open water central channel and the bulk of the Reed Sweet-

grass/Reed Canary-grass–dominated marginal vegetation; here a range of plants is to be found including the now-widespread post-2002 colonizers Lesser Water-parsnip and Flowering-rush (Table 2). A further favourable habitat for emergents in the navigable canal is cattle-poached margin. This occurred along part of Length 10 (but on the far side from the towing path and inaccessible) and especially along Length 12. Here trampling by cattle and their grazing on Reed Sweet-grass have produced an open poached muddy strip along the landward side of the Reed Sweet-grass margin extending out into the canal as far as the cattle can reach. This has allowed colonization by a diversity of emergent plants. Poached margins such as this can be a valuable resource for the conservation of plants of muddy places (Chatters, 1996).

It is well known that submerged and floating-leaved vegetation is liable to be suppressed in heavily navigated canals because of high turbidity limiting underwater photosynthesis and because of mechanical damage (e.g. Murphy & Eaton, 1983). There are, however, relatively few boat movements along the navigable section of the Pocklington Canal; thus Gardham Lock between East Cottingwith and Melbourne was operated at most only 166 times during 2011 (Anon, 2013) and no boat movements were observed during the mid-week vegetation surveys of July 2013 that are described herein. It is evident that boat traffic does not reach the level at which coexistence between boats and vegetation becomes problematic. Instead the central channel has luxuriant submerged and floating-leaved vegetation and abundant filamentous green algae, which are doubtless encouraged by the high inorganic-nutrient status of the canal. Goulder (2003) cited data from the Environment Agency that showed a mean phosphorus (as phosphate) concentration of 358µg per litre and mean nitrogen (as nitrate) concentration of 8.3mg per litre at Melbourne in 2002. Furthermore elevated phosphate levels downstream of the Melbourne feeder have been shown to promote enhanced growth of submerged plants taken from the canal (Canadian Waterweed) under laboratory conditions (Mahami & Goulder, 2011).

The community tends to be dominated by only a few plants that are often associated with eutrophic habitats and have relatively high Ellenberg's N indicator values (≥6) (Hill *et al.*, 1999). Thus Yellow Water-lily is ubiquitous in the navigable canal, both its floating leaves and its underwater 'cabbage' leaves being conspicuous; otherwise Nuttall's Waterweed often forms luxuriant submerged stands while Shining Pondweed is abundant in some sections (Lengths 9-11). Some of the less abundant submerged/floating-leaved plants that occur in the navigable canal (Flat-stalked, Broad-leaved and Fennel Pondweeds, Fan-leaved Water-crowfoot and Unbranched Bur-reed) may be helped by the occasional boat movements that prevent complete cover by the dominant plants. It was clear, for example, that boats had kept open a mid-canal gap 2-3m wide between encroaching floating leaves of Yellow Water-lily along Lengths 9 & 10.

When the Pocklington Canal was notified as an SSSI in 1987 its wildlife conservation value was, in part, considered to lie in its diversity of aquatic plants and the presence of nationally scarce taxa (Anon, 2013b). The 2013 survey described in the present paper emphasizes continuing diversity (Tables 1 & 2), especially in the navigable canal, but nationally scarce aquatic plants were not much in evidence. Plants that are nationally or locally/regionally rare or scarce which are found in South-east Yorkshire (VC61) are listed by Middleton & Cook (2013). The only nationally scarce aquatic plant that was found in the Pocklington Canal in 2013 is Flat-stalked Pondweed, which appears to have decreased since 2002 when it was recorded in all six of the

500m lengths that were surveyed along the navigable canal (and at 0.1-5% cover in two of these lengths) (Goulder, 2003) whereas in 2013 it was recorded at <0.1% cover and in only three 500m lengths. This plant appears to do well when there is a degree of disturbance; in East Yorkshire it is found in the Hull Valley in drains where there is annual weed cutting and periodic dredging (Goulder, 2000, 2010). It was also found in the Leven Canal where submerged and floating-leaved macrophytes (largely Rigid Hornwort and Yellow Water-lily) had been cleared to facilitate angling (Goulder, 2006). It is possible that Flat-stalked Pondweed in the Pocklington Canal has suffered from competition with other, much more abundant, submerged/floating-leaved plants, notably Nuttall's Waterweed, Yellow Water-lily and Shining Pondweed.

There are at least 20 vascular aquatic plant species that have been recorded in the Pocklington Canal since 1986 but were not found in 2013 (Table 4). Eleven are either nationally rare/scarce or regionally/locally rare/scarce in vice-county 61 (Middleton & Cook, 2013). Some may have been missed in 2013 because only twelve 500m lengths of canal were surveyed whereas other studies (Tolhurst, 1987; Head, 1991; Anon, 1997; Anon, 2008b) have considered the entire length of the canal. Furthermore, when surveying canals with high marginal vegetation and using a grapnel only at intervals, it is easy to miss sparsely distributed plants, especially submerged ones. The lost species of most concern are the eight that are rare/sparse and were also not recorded in 2007 along the whole canal by Scott-Wilson Ltd (2008) (Table 4). These are Lesser Water-plantain, Soft Hornwort, Opposite-leaved Pondweed, Fat Duckweed, Creeping Forget-me-not, Small and Perfoliate Pondweeds and Common Water-crowfoot. The most important of these losses are probably Lesser Water-plantain, Soft Hornwort and Fat Duckweed. Lesser Water-plantain was last recorded in VC61 in 2003 in a drain at North Cave; there are no VC61 records for Soft Hornwort other than for the Pocklington Canal, while for Fat Duckweed there is a 2008 VC61 record for the River Derwent (Middleton & Cook, *l.c.*). Opposite-leaved Pondweed is found in drains in East Yorkshire (Goulder, 2000, 2010) and there is also a 2009 record for the Pocklington Canal Head (Middleton & Cook, *l.c.*). Small Pondweed is also found in drains, is easily overlooked and may be under-recorded in the vice-county (Middleton & Cook, *l.c.*). Perfoliate Pondweed was recorded in the Market Weighton Canal at Newport in 2005 (Middleton & Cook, *l.c.*), VC61 records of Creeping Forget-me-not are possibly identification errors while Common Water-crowfoot, like many batrachian water-crowfoot species, is also difficult to identify reliably.

Overall, the 2013 survey suggests that the current botanical conservation value of the Pocklington Canal lies more in the diversity and luxuriance of its aquatic vegetation rather than in the presence of rare or scarce plants (with the exception of Flat-stalked Pondweed). The apparent losses from the non-navigable canal since 2002 are likely to be a result of unchecked hydroseral succession but it is encouraging that, except perhaps for Small Pondweed, none of the ten missing plants is rare or scarce in VC61 and that eight of them were found in 2013 in the navigable canal (the exceptions being Greater Water-moss and Small Pondweed). The apparent loss of Fat Duckweed from the navigable canal is regrettable but the evidence of greater plant diversity and species gains since 2002 suggests that habitat disturbance, associated with restoration and light boat usage and the presence of cattle-poached muddy areas, may have enhanced the plant-conservation value of the canal.

Acknowledgements
I am grateful to Dr Alistair Anderson for his valuable comments on the manuscript and to the Canal & River Trust and to Natural England for information and encouragement.

References

Anon (1997) *Pocklington Canal Macrophyte Survey*. A report prepared on behalf of British Waterways and English Nature by Scott Wilson Resource Consultants, Leeds.

Anon (2008a) *The Pocklington Canal: a Guide to the Canal*. Pocklington Canal Amenity Society, York.

Anon (2008b) *A Botanical Survey of the Pocklington Canal*. A report prepared for Natural England and British Waterways by Scott-Wilson Ltd, Peterborough.

Anon (2013) *Annual Lockage Report 2012*. Canal & River Trust, Milton Keynes (http://canalrivertrust.org.uk/media/library/323.pdf).

Anon (2013b) *Natural England Sites of Special Scientific Interest: Pocklington Canal*. http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm? sssi_id=1001799 (accessed 15 November 2013).

Chatters, C. (1996) Conserving rare plants in muddy places. *British Wildlife* 7, 281-286.

French, D.D. (1994). Hierarchical richness index (HRI): a simple procedure for scoring 'richness', for use with grouped data. *Biological Conservation* 69, 207-212.

French, D.D. & Cummins, R.P. (2001) Classification, composition, richness and diversity of British hedgerows. *Applied Vegetation Science* 4, 213-228.

Goulder, R. (2000) Aquatic macrophytes and conservation in the drains of the Hull Valley. *The Naturalist* 125, 17-28.

Goulder, R. (2003) Aquatic plants in the Pocklington and Driffield canals with regard to the potential extension of navigation. *The Naturalist* 128, 129-146.

Goulder, R. (2006) Aquatic plants in the Leven Canal, East Yorkshire: does the waterway continue to be an important site for botanical conservation? *The Naturalist* 131, 77-82.

Goulder, R. (2010). Aquatic plants in principal drains of the intensively-arable River Hull Valley. *The Naturalist* 135, 63-73.

Head, R.M. (1991) *A Survey of the Aquatic Flora of the Pocklington Canal 1990: a Comparison with the NCC Survey of 1986*. A draft report prepared by British Waterways, Environmental and Scientific Services, Gloucester.

Hill, M.O., Mountford, J.O., Roy, D.B. & Bunce, R.G.H. (1999) *Ellenberg's Indicator Values for British Plants*. ECOFACT Volume 2: Technical Annex. Institute of Terrestrial Ecology and Department of the Environment, Transport and the Regions, Huntingdon.

Holmes, N.T.H. (1983) *Focus on Nature Conservation No. 4: Typing British Rivers According to their Flora*. Nature Conservancy Council, Shrewsbury.

Mahami, T. & Goulder, R. (2011) Vascular hydrophytes for bioassay of phosphate enrichment in fresh waters: a pilot study. *West African Journal of Applied Ecology* 18, 63-69

Middleton, R. & Cook, P.J. (2013) *South-east Yorkshire (vc61) Rare Plant Register*. BSBI, London (http://bsbi.org.uk/SEYorksRPR2013.pdf).

Murphy, K.J. & Eaton, J.W. (1983) Effects of pleasure-boat traffic on macrophyte growth in canals. *Journal of Applied Ecology* 20, 713-729.

Palmer, M. & Newbold, C. (1983) *Focus on Nature Conservation No. 1: Wetland and Riparian Plants in Great Britain*. Nature Conservancy Council, Shrewsbury.

Stace, C.A. (2010) *New Flora of the British Isles* (3rd edition). Cambridge University Press, Cambridge.

Tolhurst, S.A. (1987) *A Survey of the Aquatic Flora of the Pocklington Canal, Yorkshire, 1986*. Nature Conservancy Council, North East Region, York

Table 1. Aquatic plants in non-navigable lengths of Pocklington Canal, 2002 and 2013.

Emergent species

Recorded in both 2002 and 2013

Amphibious Bistort *Persicaria amphibia* (4,2)
Bittersweet *Solanum dulcamara* (4,2)
Branched Bur-reed *Sparganium erectum* (4,4)
Brooklime *Veronica beccabunga* (1,1)
Bulrush *Typha latifolia* (4,4)
Common Reed *Phragmites australis* (4,4)
Creeping Bent *Agrostis stolonifera* (4,4)
Flowering-rush *Butomus umbellatus* (1,2)
Greater Pond-sedge *Carex riparia* (2,3)
Hard Rush *Juncus inflexus* (3,1)
Jointed Rush *Juncus articulatus* (1,1)
Lesser Pond-sedge *Carex acutiformis* (3,3)
Lesser Water-parsnip *Berula erecta* (1,3)
Reed Canary-grass *Phalaris arundinacea* (4,3)
Reed Sweet-grass *Glyceria maxima* (6,6)
Yellow Iris *Iris pseudacorus* (3,5)

Number of species = 16

Recorded in 2002 but not in 2013

Celery-leaved Buttercup *Ranunculus sceleratus* (1,0)
Common Marsh-bedstraw *Galium palustre* (1,0)
Soft-rush *Juncus effusus* (1,0)
Water Forget-me-not *Myosotis scorpioides* (2,0)
Water Mint *Mentha aquatica* (1,0)
water-cress *Nasturtium officinale* agg. (2,0)
Water-plantain *Alisma plantago-aquatica* (1,0)

Number of species = 7

Recorded in 2013 but not in 2002

Number of species = 0

Submerged and floating-leaved species

Recorded in both 2002 and 2013

Broad-leaved Pondweed *Potamogeton natans* (1,1)
Canadian Waterweed *Elodea canadensis* (5,5)
Common Duckweed *Lemna minor* (6,6)
Curled Pondweed *Potamogeton crispus* (2,2)
Fan-leaved Water-crowfoot *Ranunculus circinatus* (2,2)
Fennel Pondweed *Potamogeton pectinatus* (1,1)
Ivy-leaved Duckweed *Lemna trisulca* (5,5)
Nuttall's Waterweed *Elodea nuttallii* (4,3)
stonewort *Chara/Nitella* (1,2)
Unbranched Bur-reed *Sparganium emersum* (2,4)
Yellow Water-lily *Nuphar lutea* (4,4)

Number of species = 11

Recorded in 2002 but not in 2013

Greater Water-moss *Fontinalis antipyretica*(1,0)
Small Pondweed *Potamogeton berchtoldii* (1,0)
water-starwort *Callitriche* sp. (3,0)

Number of species = 3

Recorded in 2013 but not in 2002

Number of species = 0

Values in brackets indicate the number of 500m lengths (out of six) in which each plant was recorded in 2002 and 2013 respectively.

Table 2. Aquatic plants in navigable lengths of Pocklington Canal, 2002 and 2013.

Emergent species

Recorded in both 2002 and 2013

Amphibious Bistort *Persicaria amphibia* (3,5)
Arrowhead *Sagittaria sagittifolia* (1,6)
Bittersweet *Solanum dulcamara* (3,5)
Branched Bur-reed *Sparganium erectum* (3,6)
Brooklime *Veronica beccabunga* (2,1)
Bulrush *Typha latifolia* (2,4)
Celery-leaved Buttercup *Ranunculus sceleratus* (1,5)
Common Marsh-bedstraw *Galium palustre* (1,2)
Common Reed *Phragmites australis* (1,1)
Common Spike-rush *Eleocharis palustris* (1,1)
Creeping Bent *Agrostis stolonifera* (5,6)
Fool's-water-cress *Apium nodiflorum* (3,4)
Greater Pond-sedge *Carex riparia* (2,1)
Hard Rush *Juncus inflexus* (1,1)
Marsh Horsetail *Equisetum palustre* (1,1)
Marsh-marigold *Caltha palustris* (1,1)
Reed Canary-grass *Phalaris arundinacea* (6,6)
Reed Sweet-grass *Glyceria maxima* (6,6)
Water Forget-me not *Myosotis scorpioides* (2,3)
water-cress *Nasturtium officinale* agg. (2,6)
Water-plantain *Alisma plantago-aquatica* (1,3)
Yellow Iris *Iris pseudacorus* (1,3)

Number of species = 22

Recorded in 2002 but not in 2013

Number of species = 0

Recorded in 2013 but not in 2002

Flowering-rush *Butomus umbellatus* (0,6)
Lesser Pond-sedge *Carex acutiformis* (0,2)
Lesser Water-parsnip *Berula erecta* (0,6)
Pink Water-speedwell *Veronica catenata* (0,1)
Soft-rush *Juncus effusus* (0,1)
Toad Rush *Juncus bufonius* (0,2)
Tufted Forget-me not *Myosotis laxa* (0,4)
Water Mint *Mentha aquatica* (0,2)

Number of species = 8

Submerged and floating-leaved species

Recorded in both 2002 and 2013

Canadian Waterweed *Elodea canadensis* (1,5)
Common Duckweed *Lemna minor* (6,6)
Fennel Pondweed *Potamogeton pectinatus* (3,1)
Flat-stalked Pondweed*Potamogeton friesii* (6,3)
Ivy-leaved Duckweed *Lemna trisulca* (6,6)
Nuttall's Waterweed *Elodea nuttallii* (6,6)
Rigid Hornwort *Ceratophyllum demersum* (6,1)
Shining Pondweed *Potamogeton lucens* (4,4)
stonewort *Chara/Nitella* (5,1)
Yellow Water-lily *Nuphar lutea*(5,6)

Number of species = 11

Recorded in 2002 but not in 2013

Fat Duckweed *Lemna gibba* (3,0)

Number of species = 1

Recorded in 2013 but not in 2002

Broad-leaved Pondweed *Potamogeton natans* (0,1)
Fan-leaved Water-crowfoot *Ranunculus circinatus* (0,3)
Unbranched Bur-reed *Sparganium emersum* (0,5)
water-starwort *Callitriche* sp. (0,1)

Number of species = 4

Values in brackets indicate the number of 500m lengths (out of six) in which each plant was recorded in 2002 and 2013 respectively.

Table 3. Summary of species richness, ∑ abundance scores and hierarchical richness index for aquatic plants in the Pocklington Canal, July 2013

	Non-navigable canal	Navigable canal	*P**
	Mean (range) s.d.	Mean (range) s.d.	
Number of plants per 500m			
All plants	13.8 (7-18) 4.0	25.0 (21-34) 4.6	<0.05
Emergent plants	8.0 (3-12) 3.1	16.8 (12-24) 3.6	<0.05
Submerged and floating-leaved plants	5.8 (4-8) 1.3	8.2 (6-10) 1.6	0.05
∑ abundance scores per 500m			
All plants	24.8 (13-33) 7.1	38.3 (31-48) 5.8	<0.05
Emergent plants	13.5 (5-19) 5.6	24.0 (19-33) 4.3	<0.05
Submerged and floating-leaved plants	11.3 (8-15) 2.1	14.3 (8-18) 4.3	NS
Hierarchical richness index per 500m			
All plants	158 (41-255) 74.2	396 (265-660) 134	<0.05
Emergent plants	55.5 (8-96) 33.6	177 (96-331) 73.3	<0.05
Submerged and floating-leaved plants	33.8 (17-58) 12.9	53.5 (24-72) 20.7	NS

s.d.= standard deviation. *Mann-Whitney *U*-test, $n_1=n_2=6$. NS=$P>0.05$.

Table 4. List of checklist vascular aquatic plants (excluding water-starworts) that have been recorded from the Pocklington Canal in earlier surveys but were not recorded in 2013

Species	**Year of survey**				
	1986[1]	**1990**[2]	**1996**[3]	**2002**[4]	**2007**[5]
‡*Alisma lanceolatum* Narrow-leaved Water-plantain	+	+	+	-	+
Azolla filiculoides Water Fern	-	+	-	-	-
†*Baldellia ranunculoides* Lesser Water-plantain	+	+	-	-	-
‡*Ceratophyllum submersum* Soft Hornwort	+	+	-	-	-
Equisetum fluviatile Water Horsetail	+	-	-	-	-
†*Groenlandia densa* Opposite-leaved Pondweed	+	+	+	-	-
Juncus conglomeratus Compact Rush	+	-	-	-	-
Juncus subnodulosus Blunt-flowered Rush	+	-	-	-	-
‡*Lemna gibba* Fat Duckweed	+	+	+	+	-
‡*Myosotis secunda* Creeping Forget-me-not	+	-	-	-	-
‡*Myosoton aquaticum* Water Chickweed	-	-	-	-	+
Myriophyllum spicatum Spiked Water-milfoil	+	-	+	-	-
†*Oenanthe fistulosa* Tubular Water-dropwort	-	-	-	-	+
‡*Potamogeton berchtoldii* Small Pondweed	+	-	+	+	-
‡*Potamogeton perfoliatus* Perfoliate Pondweed	-	-	+	-	-
Potamogeton pusillus Lesser Pondweed	-	+	-	-	-

Species	Year of survey				
	1986[1]	1990[2]	1996[3]	2002[4]	2007[5]
‡*Ranunculus aquatilis* agg. Common Water-crowfoot	+	-	-	-	-
Rumex hydrolapathum Water Dock	-	-	-	-	+
Veronica anagallis-aquatica Blue Water-speedwell	+	-	-	-	-
Zannichellia palustris Horned Pondweed	+	+	+	-	-

(+) indicates a record at least at one site along the canal, (-) indicates not recorded.
The earlier surveys were: [1]Tolhurst (1987); [2]Head (1991); [3]Scott Wilson Resource Consultants (1997); [4]Goulder (2003); [5]Scott-Wilson Ltd (2008).
†Species considered to be rare/scarce using national criteria; ‡Species considered to be rare/scarce using local/regional criteria (Middleton & Cook, 2013).

Notable spiders recorded in Yorkshire in 2013

Richard Wilson 161 Burley Wood Crescent, Leeds, LS4 2QJ
email: riwspider@yahoo.uk

This report lists the spiders recorded by myself in Watsonian Yorkshire during 2013 which are considered to be noteworthy, owing to the lack of recent records. Almost all the survey work was undertaken in upland habitats (mires, peatbogs and acid grassland) within the Yorkshire Dales and North York Moors National Parks. These surveys focussed on habitats and locations with historical records of some of our rarest spiders (i.e. UK Priority species/species of principal importance). Surveys were completed during three separate periods (January-April, August-October and November-December 2013). Separate reports will be published in due course describing these surveys in more detail. A total of 114 species were recorded in VC62, VC64 and VC65 of which 13 are considered noteworthy and are detailed in tables 1 and 2 below.

Table 1. Family Linyphiidae

Species	Site and VC	Status in Yorkshire	General comments
Ceratinella scabrosa	Great Shunner Fell (VC65)	First record for VC65 and only the ninth record for Yorkshire. Most records are post-1990.	A species of southern Britain, it is frequent (historically). However, in recent times, records have become less frequent but no obvious decline. Yorkshire is at the northern edge of its range.
Walckenaeria alticeps	Tarn Moss, Malham (VC64)	First Watsonian Yorkshire record.	Probably a northern species in Europe, though only separated from *W. antica* in 1952. It is associated with *Sphagnum* mires and bogs shaded by taller vegetation (e.g. Purple Moor-

Species	Site and VC	Status in Yorkshire	General comments
			grass *Molinia caerulea*, Bog Myrtle *Myrica gale* or birches. Appears to be rarely recorded.
Walckenaeria nodosa	Tarn Moss, Malham (VC64)	Only the 5th record in Yorkshire since the early 1980s.	Widespread though uncommon in Britain and reportedly declining, though not included in the UK's priority list. Most recent records largely confined to Wales and Scotland. It is recorded in wetlands amongst moss within a wide range of habitats. Appears to be autumn and winter active.
Pelecopsis parallela	Pen-y-Ghent (VC64)	Only the 2nd record for VC64 (last in July 1961) and 6th record for Watsonian Yorkshire.	Widespread but scattered south of the Humber, rarely recorded inland to the north. Occurs in a variety of habitats including moss, detritus in woods, under stones and, especially, in calcareous and acid grasslands.
Scotinoylus evansi	Ingleborough and Rylton Fell (VC64)	First records in VC64 since 1985.	Another species associated with high ground, restricted to northern England and Scotland but absent in Wales. It is associated with grassland and heather, possibly amongst stones and other refugia. This may be under-recorded owing to its cryptic lifestyle.
Latithorax faustus	Ingleborough and Rylton Fell (VC64)	First records in Watsonian Yorkshire since 1990 and first for VC64 since 1984.	An upland species of open habitats such as grassland and mire. Lack of modern records in Yorkshire has restricted our understanding of its ecology as it may be under-recorded.
Semijicola caliginosus	Bull Bogs, Buttertubs Pass and Great Shunner Fell (VC65)	Apart from one record in October 2003, no previous records for 30 years.	**Nationally Notable b (Nb) & UK Priority species**. A species associated with dense *Sphagnum* seepage lines within wet mire vegetation.
Leptothrix hardyi	Egton Moor (VC62)	A rare species with only 17 previous records; 3 of which have been in the last 20 years.	Generally recorded in wet habitats in heathland during the winter months. Old records in southern England. Most modern records in west Wales and northern Scotland.
Hilaira nubigena	Buckden Pike (VC65)	First record for 33 years and only the 14th record since 1900.	**Nationally Notable a (Na)**. A species of wet areas, usually in association with *Sphagnum* or *Juncus* on moorland, mostly between c.400m and 700m. Adults are found in Aug. and Sept. and probably over-winter.

Species	Site and VC	Status in Yorkshire	General comments
Hilaira pervicax	Ingleborough and Tarn Moss, Malham (VC64) and Whernside (VC65)	Only 3 records in Watsonian Yorkshire in last 30 years. First record from VC65 since the mid-1980s	**Nationally Notable (b)**. Found in wet places on high ground, associated with *Sphagnum* and other wetland vegetation. Consequently, it is restricted to the northern Pennines in England with most records in the Highlands of Scotland and an outlying population in Snowdonia.
Centromerus arcanus	Buckden Pike (VC65)	First record for VC65 and first anywhere in Watsonian Yorkshire for more than 30 years.	A species of north-western Britain and much of Wales. Yorkshire falls at the south-eastern edge of its range. It occurs in upland bogs and woodlands amongst moss.
Lepthyphantes angulatus	Rylton Fell (VC64)	Only the 6th record in 20 years.	Associated with the north Pennines and the higher areas of Scotland and north Wales, but does not appear restricted to a particular habitat. The lack of Yorkshire records probably reflects under-recording.

Table 2. Family Araneidae

Species	Site and VC	Status in Yorkshire	General comments
Hypsosinga albovittata	Moorsholm Moor (VC62)	Only7 previous records in Watsonian Yorkshire from Strensall or Skipwith Commons. New record for North York Moors NP.	A small orb-web spider associated with heathland which has a scattered distribution in the UK. Note that this was an immature specimen.

The majority of the noteworthy spiders have not been recorded in Yorkshire for several decades, some upwards of 30 years. This may reflect a lack of recording effort in these upland habitats, especially during the winter months. Having said this, the mires and peatbogs associated with Malham Tarn National Nature Reserve have been visited by many arachnologists (e.g. Eric Duffey) who have failed to record these species regularly, so they may well be genuinely rare or at least present at very low densities. Information on ecology is taken from the Spider Recording Scheme website (http://srs.britishspiders.org.uk).

Acknowledgements
I would like to thank Peter Harvey for confirming/verifying some specimens and Dr Sarah Henshall (Buglife) for assisting with some of the field surveys in the Yorkshire Dales. Thanks also to Ian Court (Yorkshire Dales NP Authority Ecologist) and Rona Charles (North York Moors NP Authority Ecologist) for arranging site access as well as providing some funding. Additional funding was received from Natural England via Buglife and a small grant was received from the BAS Ted Lockett Fund for the survey work undertaken in the North York Moors NP. A separate, more detailed report will be submitted in response to this latter award.

The social history of ornithology: inscriptions in copies of Robert Dunn's 1837 *Ornithologist's Guide*

R. B. Williams Norfolk House, Western Road, Tring, Herts. HP23 4BN
e-mail: ray.coxitec@tesco.net

Introduction

The Hull taxidermist-dealer Robert Dunn (1789-1859) has until fairly recently been a somewhat obscure figure, known mainly from information published in his only book *The Ornithologist's Guide to the Islands of Orkney and Shetland* (Dunn, 1837). However, more details about his life and family, particularly one of his sons, Joseph Henry (1827?-1872), are now emerging (Limbert, 2007; Williams, 2012a). During a bibliographical study of *The Ornithologist's Guide* (Williams, 2012b), 57 copies, some of which contain presentation inscriptions by the author or other persons, or signatures and notes of owners, were traced in various libraries around the world.

The inscriptions found are transcribed herein, providing a contribution to the social history of ornithology centred on Robert Dunn. Whilst some of the persons mentioned clearly could not have known Dunn, their ownership of his book might add to knowledge of their connections with other persons in the field of ornithology or even more widely. Of greatest importance, however, are revelations of hitherto unknown associates of Dunn himself. Moreover, some inscriptions have already provided valuable information on the publishing history of *The Ornithologist's Guide* (Williams, 2012b).

Author's presentation inscriptions

Three presentation inscriptions by Robert Dunn were discovered (Table 1) but, unfortunately, none is dated. Figure 1 shows one of them, providing a sample of Dunn's handwriting. Attempts were made to identify the recipients of these presentation copies of *The Ornithologist's Guide* (numbered in bold type according to Table 1):

Table 1. Verbatim presentation inscriptions by Robert Dunn in copies of *The Ornithologist's Guide*.

No.	Presentation inscription	Library and shelf-mark
1	*To Captn Parker. From the author*	Hull History Centre, Hull, UK (L.001 DUN)
2	*R. C. H. Wallendahl Esqr. Bergen Norway Presented by the Author.*	David R. Wilson, UK (DW/1)
3	*To Mr. Driffill. From the author*	Thomas Fisher Library, Toronto, Canada (Science 00802)

1. It seems very likely that the "Captn Parker" was John Parker (1800-1867), master for many years of the barque *Truelove* (Lubbock, 1937), perhaps the most famous of the Hull whalers. From the "Weide Fiord, East-side Davis' Straits", Parker (1853) wrote "An unexpected chance of despatch permits me the opportunity of inflicting a few hasty lines upon your patience with a very brief epitome of the leading occurrences which have happened to this jolly old barque." This light-hearted introduction belied the dramatic account of the *Truelove's* survival of storms, ice and a stove-in hull. She was the last of the Hull whaling fleet to sail to the Davis Strait in 1867, there having been more than sixty ships in older times (Anon, 1867).

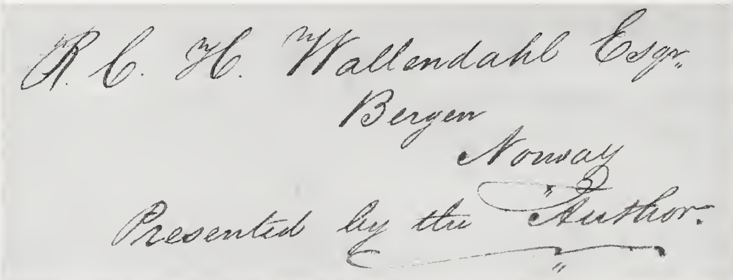


Figure 1. Presentation inscription (no. 2) of Robert Dunn to R. C. H. Wallendahl of Bergen, Norway.

Parker had relinquished command of the *Truelove* by 1854 (Anon, 1854) but continued as master of other ships at least until 1858 (McClintock, 1858). He was renowned for his bravery and humanitarian values, having saved the lives of wrecked sailors (Anon, 1852), played a significant role in the search for the ill-fated Franklin Expedition (Anon, 1849; Parker, 1851), and brought back to Hull in 1847 a young married couple of "Esquimaux" (Anon, 1847, 1867) in order to bring to the attention of the British public the poor treatment of the Inuits at the hands of European whalers and sealers. The Esquimaux couple, 17 and 15 years old, were accompanied by a live half-grown Polar Bear *Ursus maritimus*! (Anon, 1847).

Though this identification of Parker is practically certain to be correct, his particular connection with Robert Dunn must at present remain speculative. Doubtless, however, Parker could have been an invaluable source of information on the natural history of arctic waters and islands, may have brought back specimens and may even, on occasion, have transported Dunn with his heavy equipment to the Shetland Islands and back. Dunn made his first collecting-trip to Shetland on 21 March 1831 (Dunn, *l.c.*), where the Davis Strait whalers would often break their journeys northwards to take on extra crew and prepare for the Atlantic crossing (Scoresby, 1820; Dunn, *l.c.*). It was certainly not Parker, however, who transported Dunn in 1831 since he had already sailed for the Davis Strait from Lerwick, Shetland, on 27 January (Anon, 1831), commanding the *Harmony*.

Nevertheless, Dunn's trip falls within the period when most whalers sailed north out of Hull and Newcastle. For instance, Captain George Palmer of the *Cove* logged his northward voyages between 18 March and 11 April during the years 1820-1832, with dates of return to the home port between 21 September and 10 November (Stonehouse & Gunn, 2013). The whalers would yet again stop off at Orkney or Shetland during their home voyages, and these dates are consistent with Dunn's return from Shetland to Hull in October or November of 1831 (Dunn, *l.c.*: 1). Likewise, Dunn's visit to Orkney in 1832 spanned spring to autumn (Dunn, *l.c.*: 1), during which time he married a Stromness woman (Limbert, *l.c.*: 2). Closing another visit to Orkney in 1833 he obtained a passage back to Hull on the whaler *Isabella* on 13 October, her having just rescued the survivors of Captain John Ross's polar expedition (Dunn, *l.c.*; Limbert, *l.c.*: 2). Master of the *Isabella* was Captain Humphreys (Anon, 1833); hence, Parker was just one of several whaler captains who could have facilitated Dunn's expeditions to the northern islands. Of course, Dunn could also have availed himself of the various commercial steam-vessels plying between Hull and Leith or the schooners and sloops sailing from Leith to Lerwick, Kirkwall and Stromness (Dunn, *l.c.*: 127-128).

2. The name of R.C.H. Wallendahl and his association with the town of Bergen (Figure 1) is so distinctive that it is extremely unlikely to have been anybody other than Rasmus Carolius Hansen Wallendahl (1823-1896), the son of Ellert Andreas Wallendahl, who established the Wallendahl Trading House as a supplier of hardware in 1822. Rasmus passed the merchants' examination in 1839 at the age of 16, after which he was sent on an educational tour of England, France and Germany, although the dates of this tour are uncertain. He became a partner in his father's company in 1848, ultimately becoming a very wealthy businessman.

The circumstances surrounding Robert Dunn's presentation to Wallendahl are puzzling; unfortunately, it is not dated. Wallendahl would have been only 14 years old when *The Ornithologist's Guide* was published in 1837 and he could have visited England no earlier than 1839, so his meeting Dunn around that time seems rather unlikely. Furthermore, it is difficult to envisage what interest the young man might have had in Dunn's book. His only tenuous link to natural history appears to be his gift of a stuffed "Mountain Grouse" (presumably a Ptarmigan *Lagopus muta*) to the Bergen Museum in 1853. Other than that, he became involved in the manufacture of fishing-hooks, but that was not until the 1870s, so ornithology and hunting do not seem to have been of any special interest to him.

However, Dunn did not necessarily present his book to Rasmus Wallendahl in England. Plausible explanations for this presentation copy might depend on Robert's travels. There is now firm evidence that he collected eggs in Norway in 1840 (see Appendix 1) and there are tenuous clues that he may also have made other visits there. For instance, Cambridge University Zoological Museum has a Golden Plover *Pluvialis apricaria* skin from Norway in the H.E. Strickland Collection, supplied by Robert in 1838 (Salvin, 1882) and in 1842 he offered eggs and skins of the Great Auk *Pinguinus impennis* to the Doncaster taxidermist-dealer Hugh Reid, who wrote to Robert Champley in 1860 "I believe he had them from Norway" (Grieve, 1885), although it is certain that Great Auk specimens could not have been actually collected there (M. Limbert, *in litt.*, 4 September 2013). Hence, neither of these instances proves absolutely that Robert visited Norway; in either case, material could equally have been sent to him in Hull by some Norwegian

agent. Unless further evidence emerges, Dunn's only proven visit to Norway remains that in 1840.

Perhaps he obtained supplies for his 1840 and/or other Norwegian expeditions in Bergen and, if that were the case, he might well have presented his book to Rasmus when dealing with his father as a way of developing a rapport with the Wallendahl family and cementing a firm business relationship. The words "Presented by the Author" certainly seem more formal than simply "From the author", as in the other presentation inscriptions. Furthermore, the Bergen Museum's "Mountain Grouse" might have been a Dunn specimen originally presented to the Wallendahl family but it has not proved possible to confirm this. Another possibility is that Rasmus and Dunn met in Shetland at some time after Dunn settled there in 1842 (Limbert, *l.c.*), since the Wallendahl Trading House might have had business connections in Shetland.

3. There are no clues to identify "Mr. Driffill". Whoever he was, he was quite probably a local resident, since that surname is concentrated particularly in Yorkshire and Lincolnshire. However, Pigot's 1834 Directory of Hull has only a single record of that name in trade: Thomas Driffill, a ship chandler of West End Old Dock. Whilst it is possible that Robert Dunn, as a fellow tradesman and occasional seagoing traveller, might have had a connection with such a person, I have no evidence at present.

Table 2. Owners' and presentation inscriptions in Robert Dunn's *The Ornithologist's Guide*. Additional notes and queries in square brackets.

No.	Named owners' inscriptions	Library and shelf-mark
4a & b	*Thos B Locke* [or Loche, or Lache?]. *From the library of J. Cochin* [?]	Hull History Centre, Hull, UK (L.001 DUN)
5a & b	*C.D. Heathcote London 21 April 1899.* *So scarce that when I was first at Stromness in 1861 the Author's Son (who was afterwards drowned) could neither give or sell me a Copy. He is mentioned on Page 24 & 61.* *H. W. Feilden. From C. D. Heathcote 10 February 1900*	Hull History Centre, Hull, UK (L.001 DUN)
6	*W^{m} Jardine* [Notes on provenance and references to Elwes (1930)]	Royal Ontario Museum, Toronto, Canada [RB.QL690.G7D86.1837]
7a & b	*W. B. Alexander.* *Cpt. Kellan* [?] *Johnstone*	Alexander Library of Ornithology, Oxford, UK (RBC)
8	*This book is now scarce & worth threble its former value. H.S. 1870*	University Library, Bristol, UK (Restricted W)
9	[Erasure] *16th Feby 1837* *Alfred Newton, 19 May 1864*	Newton Library, Zoology Department, Cambridge, UK (Brit 143)
10a & b	*Charles Waterton, Walton Hall a present from him to his ever dear friend Doctor Hobson*	Newton Library, Zoology Department, Cambridge, UK (Brit 171)
11	*William Lagin 1840*	David R. Wilson, UK (DW/3)

No.	Named owners' inscriptions	Library and shelf-mark
12a, b, c & d	*B^{t} from Quaritch Aug 1918 for 13/-* *~~E Forbes in remembrance of T.Bazett Tytte 1841~~ [sic]* *Percy E. Coombe Nov.^{r} 1857.*	Radcliffe Science Library, Oxford, UK (18961.E.271)
?13	*H. E. Dresser 7. New Broad Street EC.*	John Rylands Library, Manchester, UK (R216484)
14	*H. Wyndham*	Hull Reference Library, Hull, UK (598.294113 RT)
15	*William MacGillivray*	University Library, Aberdeen, UK (SB 5987(4112) Dun 1)
16	*From J. A. Harvie-Brown*	David L. Clugston, UK
17	*C.D. Heathcote, London, 4th May. 1903. So scarce, that when I was first at Stromness in 1861, the Author's Son (who was afterwards drowned) could not sell me a Copy. He is mentioned on Pages 24 & 61.* *Great Awk. P. 103* [At the end of this copy is a manuscript excerpt from Evans & Buckley (1899: xix)]	Shetland Museum and Archives, Lerwick, UK (SA4/1759)
18	*JH Gurney Jun Northrepps May / 83*	Natural History Society of Northumbria, UK (598.29411)
19a & b	[Letter from William Yarrell to J. G. Barclay tipped in - see transcription by Williams (2012b: 70)]	Royal Library, Copenhagen, Denmark (8 Zool. 15265/500)
20a & b	*Presented to John Barrow Esq with the best respects of the Editor Edwin C Prince Jan. 25 : 1854.*	Smithsonian Institution Libraries, Washington DC, USA (QL690.G7D86 1837 SCNHRB)
21a & b	*John Scott Esquire of Scalloway from his Affectionate Son John James Scott*	Shetland Museum and Archives, Lerwick, UK (SA4/2475/111)

Other inscriptions

Eighteen other copies of *The Ornithologist's Guide* were found to contain presentation inscriptions, signatures of owners or other notes. Although some names are those of well-known personages, others remain enigmatic. Some later owners of Robert Dunn's book would not, of course, have known him at all, crucial time-points being Dunn's removal from Hull to Shetland in 1842 and his death in Hull in 1859 (Limbert, *l.c.*). Nevertheless, all the inscriptions found are here transcribed (Table 2) since they may provide important information relevant to future research on Robert Dunn, his associates or later owners of *The Ornithologist's Guide*. Notes on persons identified with certainty and some slightly questionable identifications (numbered in bold type according to Table 2) follow:

5b. Henry Wemyss Feilden (sometimes spelt Fielden) (1838-1921), Confederate soldier in the American Civil War, British army officer, amateur ornithologist and naturalist on *H.M.S. Alert* (National Arctic Expedition, 1875-76) (see Mullens, 1921; Sauer, 1982: 196; Mearns & Mearns, 1998; Beolens & Watkins, 2004). Feilden was a close friend of Rudyard Kipling (1865-1936), who habitually addressed his letters to "Colonel Sahib" or "The Destroyer of Winged Birds" (Pinney, 1999). A mutual acquaintance was J.H. Gurney, junior (**18**) (Pinney, *l.c.*: 20). Kipling's letters to Feilden include several observations on ornithology but, interesting though they may be, neither

individual would have known Robert Dunn and Feilden received his copy of *The Ornithologist's Guide* as a gift from C.D. Heathcote (**5a**) as late as 1900.

6. Sir William Jardine (1800-1874), 7th Baronet of Jardine Hall, Applegirth, Dumfriesshire (see Mullens & Swann, 1917: 309-311; Jackson & Davis, 2001). Since Jardine most certainly knew John Gould and his business manager Edwin Prince, who edited Robert Dunn's book (see **20b**), he may well have known Dunn through them.

7a. Wilfrid Backhouse Alexander (1885-1965), founder of the Alexander Ornithology Library and first director of the Oxford Bird Census (predecessor of the Edward Grey Institute) (see Nicholson, 1966). Alexander was born too late to have had any connection with Robert Dunn.

8. The style of handwriting of the initials "H.S." closely matches that of Howard Saunders (1835-1907) and the date '1870' is consistent with that identification. The inscription probably dates from when Saunders obtained his copy, long after Robert Dunn had died, and no doubt is a rueful reflection on the price he had to pay! His spelling "threble" is most odd; it appears that he was uncertain whether to write "thrice" or "treble".

9. Alfred Newton (1829-1907), Professor of Zoology and Comparative Anatomy, University of Cambridge, 1866-1907 (see Mullens & Swann, *l.c.*: 442-448). Newton could not have known Robert Dunn when he published his book but may have become acquainted with him shortly before he died. Newton apparently acquired the book in 1864, long after Dunn died; the date '1837' in the other inscription must be associated with the original, unidentified owner whose name is apparently erased.

10a. Charles Waterton (1782-1865) of Walton Hall, Wakefield, the well-known eccentric naturalist (see Moore, 1871; Mullens & Swann, *l.c.*: 615-617). Considering Robert Dunn's depredations of the birds of Orkney and Shetland and in view of his own sympathetic attitude to nature conservation, this book was a curious gift for Waterton to have made to his friend Richard Hobson. Doubtless, though, Waterton lived at a time and place that would have facilitated possible contact with Dunn, and they also shared a common interest in taxidermy.

10b. Richard Hobson (1782-1865) of Park Place, Leeds, Honorary Physician at Leeds General Infirmary (1832-1839) and close friend and biographer of Charles Waterton (see Hobson, 1866).

12a. "Quaritch" was the well-known London book-dealer Bernard Alexander Christian Quaritch (1819-1899) but only his company name survived when this copy was bought in 1918.

12b. "E. Forbes" is very likely to have been Edward Forbes (1815-1854), the eminent marine biologist, botanist and geologist who died having only just been appointed Professor of Natural History at Edinburgh University. Although Forbes is not generally known for any great interest in birds (Mullens & Swann, *l.c.*: 211), Salvin (*l.c.*: xi) lists "FORBES, E., Professor, *Edinburgh*" as one of the sources of bird skins in the Hugh Strickland (1811-1853) Collection in the Cambridge University Museum of Zoology. All the Forbes specimens are given as "Orkney (*Forbes*) 1837" or "Orkney (*E. Forbes*) 1837", the year being that when Strickland received the skins. The 18-years-old Forbes had visited the Orkneys in June 1833 but was ashore for only a few hours and,

although close to sea-bird roosts, he apparently collected mostly botanical specimens; he did not return to the Orkneys until 1839 (Wilson & Geikie, 1861: 204-206, 245). Coincidentally, Dunn was also in the Orkneys from January to September 1833 (Dunn, *l.c.*). Could he have supplied some bird skins to Forbes, who later passed them to Strickland? So far, however, there is no evidence that Forbes met Dunn on that occasion and the identity of the person who presented Dunn's book to Forbes remains unknown. Whilst Forbes and Strickland interacted professionally as geologists, their shared ornithological interest is not widely known, although letters (E-0532, 16 February 1841; E-1779, 26 August 1841; E-1780, 20 April 1842) between them about making observations on birds and obtaining specimens during Forbes's travels are held by the Cambridge University Museum of Zoology (Rookmaaker, 2010). However, Dunn's direct connection with either Forbes or Strickland is tenuous at best. Although Edwin Brown, a Burton-on-Trent naturalist, informed Strickland of Dunn's Shetland address (E-0158, 3 October 1850), no letters between them are preserved in the Strickland archive (Rookmaaker, 2010).

12c. Disappointingly, T. Bazett Tytte, mentioned "in remembrance" in the 1841 E. Forbes inscription, is not recorded as an associate of the famous Edward Forbes (see Wilson & Geikie, *l.c.*), nor could I find any other record of this man.

13. Henry Eeles Dresser (1838-1915), businessman and sometime Secretary of the British Ornithologists' Union 1882-1888 (see Mullens & Swann, *l.c.*: 178-180). Considering his year of birth and his profession, Dresser is unlikely to have known Robert Dunn. The address "7 New Broad Street EC" adds another to the four private addresses in London, besides the Athenaeum Club, listed for Dresser in the archives of the Natural History Museum, London.

15. William MacGillivray (1796-1852), Conservator of the Museum of the Edinburgh College of Surgeons (1831-1841) and Professor of Civil and Natural History in Marischal College, Aberdeen (1841-1852) (see Mullens & Swann, *l.c.*: 367-372). MacGillivray was an eminent ornithologist and author who was likely to have had an interest in the northern islands and so may well have known Robert Dunn.

16. John Alexander Harvie-Brown (1844-1916) of Dunipace House, Larbert, Stirlingshire, sometime editor of the Scottish Naturalist and author of several volumes on the vertebrate fauna of Scotland (see Mullens & Swann, *l.c.*: 279-284; Freeman, 1980). Considering his year of birth, Harvie-Brown almost certainly could not have known Robert Dunn, but he took considerable interest in his past activities and those of his son Joseph in the Orkneys (Buckley & Harvie-Brown, 1891).

17. C.D. Heathcote remains unidentified but might have been related in some way to John Moyer Heathcote (1834-1912) and John Norman Heathcote (1863-1946) (see Mullens & Swann, *l.c.*: 290), although I have no evidence for that at present. This inscription is almost identical to the one he made in another copy (see Table 2, **5a**) and shows that he met Joseph H. Dunn in Stromness. In the copy containing inscription no. **17** there is an account of Robert's visits and residence in Shetland on the rear free endpaper taken from a book and transcribed *verbatim* here:

> "In 1838 M^{r}. R. Drozier of Holt in Norfolk visited Shetland, & with his paper in the 3rd. volume of Loudon's Magazine began a new epoch for the islands. Since that date the

> interest aroused in the ornithologists of England has never flagged, though a regrettable increase in the number of birds shot & of eggs taken has to be recorded. The 1st. serious instance of depridation [*sic*] was in 1831, when Robert Dunn, a Hull bird-stuffer, resided in Shetland from the end of March till October or November; he subsequently paid a couple of visits to the Orkneys, & returned to Shetland in 1835. Possibly he has been made to some extent the scapegoat of the sins of others, but that he distinctly contributed to the diminution of various species cannot be doubted, & evidence to that effect can be gathered from his Ornithologist's Guide to the Islands of Orkney & Shetland, published at Hull in 1837. Dunn was again in the islands from the spring of 1843, until the same season of 1848, if not later, during which years his main residence was at Helister [*sic*], near Weisdale." Shetlands. By T. E. Buckley & A. H. Evans. 1899. (?).

Heathcote's stated source of this excerpt is incorrect; it should be Evans & Buckley (1899: xix).

18. John Henry Gurney, junior (1848-1922) of Northrepps, Norfolk, philanthropist and eminent ornithologist and son of John Henry Gurney, senior (1819-1890), an equally eminent ornithologist (see Mullens & Swann, *l.c.*: 259-264; Gurney, 1923). Considering his year of birth, Gurney is unlikely to have known Robert Dunn.

19a. William Yarrell (1784-1856), London newspaper agent, sportsman, naturalist and author (see Mullens & Swann, *l.c.*: 667-672). Yarrell's letter is transcribed in full by Williams (2012b: 70); it refers to a London agent for Robert Dunn's book, most probably (in view of its date) John Van Voorst (1804-1898). Yarrell's personal friendship with Van Voorst is well known (Williams, 2004). However, the mutual interconnections involving Yarrell, John Gould (Dunn's other selling agent), Gould's secretary Edwin Prince (see **20b**) and William Jardine (see **6**) are not so generally known (Jackson & Davis, *l.c.*: 130). Clearly, Dunn was known to Prince, who edited *The Ornithologist's Guide*, and he also could have had direct contact with Yarrell and maybe Jardine, although no letters between them appear to be known. However, letters between both Robert and Joseph H. Dunn and John Gould do exist (Limbert, *l.c.*: endnotes 22, 50; Sauer, 1995). These men would have had much in common, since Gould was also a taxidermist in his early life (Lambourne & Jackson, 1993).

19b. Joseph Gurney Barclay (1816-1898), Quaker banker and amateur astronomer of Knotts Green House, Leyton (or Leighton), Essex. As well as Yarrell's 1839 letter to him, this copy of *The Ornithologist's Guide* contains Joseph Barclay's bookplate (presumably as of 1839) and also the bookplate of his son Edward Exton Barclay (1860-1948) of Brent Pelham Hall, Hertfordshire, Master of the Puckeridge Hunt. Barclay knew Yarrell personally, as indicated by the note: "Joseph Gurney Barclay, Esq., who lives at Leighton, on the London border of Epping Forest, pointed out to me a nest of this bird [the Hawfinch *Coccothraustes coccothraustes*] in an apple tree in his garden. This gentleman had also taken a nest from a tall whitethorn on [*sic*] the forest, from which example the figure forming the vignette to this account was drawn." (Yarrell, 1839: 485). Though not a well-known ornithologist, J. G. Barclay clearly took a more than passing interest in birds and made a small contribution to Yarrell's classic British bird book.

20a. This "John Barrow" cannot be Sir John Barrow (1764-1848), commemorated in the eponymous Barrow's Goldeneye *Bucephala islandica*, since he had died by 1854 when this

presentation was made. No such person is numbered among the associates of Edwin Prince (see **20b**) nor John Gould by Sauer (1982, 1995).

20b. Edwin Charles Prince (1809-1875), secretary and business manager from 1830 to 1875 for John Gould (1804-1881), the self-published ornithologist (see Sauer, 1982; Lambourne & Jackson, *l.c.*; Jackson & Davis, *l.c.*: 129-130). This inscription (Table 2, also Williams, 2012b: Figure 2) provides the evidence for Prince's having edited *The Ornithologist's Guide* for Dunn (Mullens & Swann, *l.c.*: 186) and, furthermore, for Gould's acting as its selling agent (Williams, 2012b: 67-68). Pennington (2004) commented on the inclusion in Dunn's book of several quotations from Edmondston (1809). It seems quite likely that such insertions were made by Prince since he was well educated and, unlike Dunn, would presumably have had relatively easy access to such works. Prince's literary advice was apparently also valued by more eminent authors since he suggested (E-1198, 25 February 1845) changes to a paper by Hugh Strickland regarding public and private natural history collections (Rookmaaker, 2010).

21a. John Scott (1791-1850) of Scalloway, Shetland (see Grant, 1893: 239). As Robert Dunn lived at Hellister, not far from Scalloway, from 1842 to 1854 (Williams, 2012a), it is quite possible that he knew Scott and his son (**21b**), although neither father nor son appears to have published anything on birds.

21b. John James Scott (1816-1844), son of John Scott of Scalloway, Shetland (see Grant, *l.c.*: 239).

Supplementary notes

Two eggs collected by Robert Dunn and apparently once owned by John Gould are in the Natural History Museum at Tring (NHMT) (see Appendix 1 for details). Letters from Dunn to Gould *c.*1832 and 1848 (Limbert, *l.c.*: endnote 22) confirm that they knew each other, so it is possible that Dunn supplied the eggs directly. Other, admittedly tenuous, connections between Robert Dunn and egg-collectors, notably Henry Seebohm (1832-1895), are suggested by the occurrence of eggs supplied by him in other collections held in the NHMT (Appendix 1). There is often difficulty in proving whether Dunn collected those eggs personally and, furthermore, whether he was the direct supplier or only an intermediary. However, there is no doubt that John Drew Salmon (1802-1859) knew and personally dealt with Dunn; Salmon's egg-collection catalogue also provides firm evidence for Dunn's collecting in Norway, at least in 1840 (Appendix 1). Incidentally, there is the skin of a Golden Plover from Norway, supplied by Robert Dunn, in the Hugh Strickland Collection in the Cambridge University Museum of Zoology (Salvin, *l.c.*: 594). It is not known whether Dunn was the collector, direct supplier or intermediary; and since Strickland received the skin in 1838, none of this provides clear evidence for when the skin was actually collected nor whether Robert visited Norway to obtain it. Salvin (*l.c.*: x) attributed eight skins in the Strickland Collection index to "Dunn, Dealer, *Hull*" but six of the individual entries actually state "Illinois (*T. Dunn*) 1851", clearly a different person.

Robert was not the only one of his family to collect specimens in Norway (see previously in Wallendahl notes (**2**)). William Boynton Dunn did so in 1834, although that was in Svalbard in the far north (Williams, 2012a), where he unfortunately died. Furthermore, Buckley & Harvie-Brown (*l.c.*: 205) noted that "Dunn" (presumably Joseph, who succeeded to Robert's business in

1859) possessed some Norwegian Turnstone *Arenaria interpres* eggs (see also Appendix 3); whether he collected them himself or obtained them from some agent is unknown but perhaps they were inherited from Robert. Incidentally, another link between Robert and William B. Dunn, discovered since publication of Williams (2012a), is that whilst Robert was recorded as "late of 10, Castle-street" on 4 July, 1834 (Williams, 2012a: 141) William was resident at that address according to Pigot's 1834 Directory of Hull. Perhaps some clues about the timing of Robert's foreign collecting trips might be gained by analysing dates of the occasions when William apparently looked after the business in his absence (see Limbert, *l.c.*: endnote 4).

Some information on Robert and Joseph when at Stromness was recorded by Elwes (1930). Henry John Elwes (1846-1922) never knew Robert but bought eggs from him when only a schoolboy c.1854, ordered apparently from a printed catalogue. I have been unable to trace any such catalogue in British libraries but use of the word "published" (Elwes, *l.c.*: 14) might not necessarily allude to *printed* copies. Sale lists issued by Dunn are rare but the Natural History Society of Northumbria possesses a manuscript one of bird skins and eggs (Great North Museum: Hancock accession no. NEWHM: 2002.H1005) dated 19 April 1852, when the Dunns lived in Shetland. However, perhaps what Elwes actually saw c.1854 was an earlier version of the list of British birds printed by Edward Newman that Dunn issued from Stromness in 1857, annotated with prices of eggs (Limbert, *l.c.*: Figure 2). If that were so, it would represent the earliest known example of a British egg-dealer's catalogue (*cf.* Limbert, *l.c.*: 5). Interestingly, this allusion by Elwes to a published catalogue in 1854 coincides with Robert's removal from Shetland to Orkney, when he might well have decided to issue more business-like lists from his new address. Furthermore, if Elwes really saw a *printed* egg-catalogue it would predate the earliest yet known, that published by Joseph, perhaps *c.*1867 (Limbert, *l.c.*: 9).

Such printed lists of bird names had been available for some years. Issued as folio sheets or folded into sections they were printed either on both sides for exchange lists or on one side for labelling collections (Williams, 1993). Significantly, the title of the list annotated by Robert, although reprinted by Newman, coincides almost exactly with that of one issued *c.*1845 by F. Makeig of Crewkerne (see Freeman, *l.c.*: no. 3677). Van Voorst later advertised *A List of British Ornithology* at 2s. per dozen (inserted in Newman, 1849), followed by *The 'Zoologist' List of Birds Observed in Great Britain and Ireland* (*c.*1856, at 2d. each) which, as *The Zoologist List of British Birds*, cost 3d. post-free, printed on both sides, or 5d. post-free, printed on one side in July 1866 (inserted in Crichton, 1866). These lists would have been available in bulk but, because of their particular purposes, few now survive intact.

Elwes went with A.W. Crichton to Stromness in 1865 where they lodged with Joseph, who also acted as their guide and boatman (Elwes, *l.c.*: 23) (see Appendix 2 for further details). More anecdotes involving field-trips with Joseph are provided in Crichton (*l.c.*), which records his earlier visit during May and June of 1860. Clearly, Joseph regularly supplemented his naturalist's trade in the Orkneys by providing comprehensive "package holidays" for bird collectors (see also Limbert, *l.c.*: 9); he advertised accommodation and various activities in his printed *Priced Catalogue* (see Cole, 2006). However, these island expeditions were not for the faint-hearted; sadly, Joseph and his boatman John Heddle were drowned returning from a shooting excursion on 28 November 1872, although their client, an army officer named Captain Campbell, survived (Anon, 1872a, 1872b, 1872c; Elwes, *l.c.*: 23).

J.A. Harvie-Brown (**16**) certainly never met Robert Dunn but he took considerable pains to obtain information about him for Buckley & Harvie-Brown (*l.c.*). In Appendix 3 of the present paper may be found transcriptions of references to Robert and his son Joseph in that book; these original anecdotes and extracts from letters obtained from acquaintances of the Dunn family complement the newspaper articles gathered by Williams (2012a). However, none of the unidentified names among the inscriptions in *The Ornithologist's Guide* was found among the many characters mentioned by Buckley & Harvie-Brown (*l.c.*).

Concluding remarks

Among the identifiable inscriptions, the most interesting personages certainly known to Robert Dunn are Captain John Parker of Hull (**1**), the Norwegian, Rasmus C. H. Wallendahl (**2**) and Edwin Prince (John Gould's secretary) (**20b**). Inscriptions of various contemporary naturalists, such as William Jardine (**6**), William MacGillivray (**15**), Charles Waterton (**10a**) and William Yarrell (**19a**), may hint at direct, but so far unconfirmed, associations with Dunn, while Prince's inscription further strengthens the possibility of links with Jardine and Yarrell. The extant letters from Dunn (see previously) provide a certain link with Gould, as would be expected from the inscription by Prince.

Unfortunately, persons mentioned in inscriptions by the names of John Barrow (**20a**), J. Cochin [?] (**4b**), Percy E. Coombe (**12d**), Mr Driffill (**3**), C. D. Heathcote (**5a** & **17**), Cpt. Kellan [?] Johnstone (**7b**), William Lagin (**11**), Thos B. Locke [?] (**4a**), T. Bazett Tytte (**12c**) and H. Wyndham (**14**) could not be identified. Extensive searching of standard biographical and bibliographical sources, as well as the online catalogue of the archives of the Natural History Museum in London (NHML), failed to find them.

It is regrettable that in one dated copy of *The Ornithologist's Guide*, there is an erasure before the date of 16 February 1837, because it has obliterated what was most probably the name of the owner of the earliest recorded copy (Williams, 2012b). Surprisingly, the culprit may have been none other than Professor Alfred Newton of Cambridge (**9**), one of the most finicky ornithological authors of his time.

The inscriptions of C.D. Heathcote (**5a** & **17**) indicate that he met Joseph H. Dunn at Stromness in 1861; furthermore he provides a later link with an intriguing wider network including Colonel H.W. Feilden (**5b**), J.H. Gurney, junior (**18**) and Rudyard Kipling (Pinney, 1999). In addition, ownership of a copy of *The Ornithologist's Guide* by Edward Forbes (**12b**) has serendipitously revealed an unexpected ornithological connection between him and Hugh Strickland. Hence, a fascinating result of the research on these inscriptions has been the emergence of links between certain eminent individuals not generally known to have shared particular interests.

Acknowledgements

I thank the librarians and bibliophiles who reported inscriptions in copies of Dunn's book in their care and David Wilson for permission to reproduce the presentation inscription from one of his copies. Douglas Russell and Alison Harding kindly facilitated my examination of eggs and relevant documents in the Natural History Museum, Tring. For biographical information on R.C.H. Wallendahl, I am indebted to Gunnar Langhelle of the Bergen University Museum. I am

also grateful to Martin Limbert for critically reading several drafts of this paper and for valuable advice that has much improved it.

References

Anon (1831) Shipping intelligence. *The Hull Packet and Humber Mercury*, 8 March: 4.

Anon (1833) The Northern Expedition. Captain Ross and his crew. *The Hull Packet and Humber Mercury*, 18 October: 3.

Anon (1847) Arrival of two Esquimaux. *The Hull Packet and East Riding Times*, 19 November: 4.

Anon (1849) Arrival of the Truelove. Important news. Safety of Sir John Franklin. *The Hull Packet and East Riding Times*, 5 October: 5.

Anon (1852) Davis' Straits Fishery. *The Hull Packet and East Riding Times*, 12 November: 5.

Anon (1854) Greenland and Davis' Straits Fishery. *The Hull Packet and East Riding Times*, 10 March: 5.

Anon (1867) Departure of the barque *Truelove*. *The Hull Packet and East Riding Times*, 15 March: 3.

Anon (1872a) Melancholy boat accident at Stromness--Two lives lost. *Orkney Herald*, 4 December: 3.

Anon (1872b) Death. *Orkney Herald*, 4 December: 3.

Anon (1872c) Accident at Stromness. *The Orcadian*, 7 December: 3.

Baikie, W.B. & Heddle, R. (1848) *Historia Naturalis Orcadensis. Zoology, Part 1*. J & W. Paterson, Edinburgh.

Beolens, B. & Watkins, M. (2004) *Whose Bird?* Christopher Helm, London.

Buckley, T.E. & Harvie-Brown, J.A. (1891) *A Vertebrate Fauna of the Orkney Islands*. David Douglas, Edinburgh.

Cole, A.C. (2006) *The Egg Dealers of Great Britain*. Peregrine Books, Leeds.

Crichton, A.W. (1866) *A Naturalist's Ramble to the Orcades*. John Van Voorst, London.

Dunn, R. (1837) *The Ornithologist's Guide to the Islands of Orkney and Shetland*. Published privately, Hull.

Edmondston, A. (1809) *A View of the Ancient and Present State of the Zetland Islands*. Longman, Hurst, Rees & Orme, London, and John Ballantyne & Co., Edinburgh.

Elwes, H.J. (1930) *Memoirs of Travel, Sport, and Natural History*, edited by E. G. Hawke. Ernest Benn Limited, London.

Evans, A.H. & Buckley, T.E. (1899) *A Vertebrate Fauna of the Shetland Islands*. David Douglas, Edinburgh.

Freeman, R.B. (1980) *British Natural History Books 1495–1900: a Handlist*. Dawson, Folkestone.

Fuller, E. (1999) *The Great Auk*. Published privately, Southborough.

Grant, F.J. (1893) *The County Families of the Zetland Islands*. T. & J. Manson, Lerwick.

Grieve, S. (1885) *The Great Auk, or Garefowl* (Alca impennis, *Linn*.). Thomas C. Jack, London, and Grange Publishing Works, Edinburgh.

G[urney], R. (1923) John Henry Gurney, F.L.S., F.Z.S. 1848-1922. *Transactions of the Norfolk and Norwich Naturalists' Society*, 11: 457-476.

Hobson, R. (1866) *Charles Waterton: his Home, Habits, and Handiwork*. Whittaker and Company, London.

Jackson, C.E. & Davis, P. (2001) *Sir William Jardine: a Life in Natural History*. Leicester University Press, London.

Lambourne, M. & Jackson, C.E. (1993) Mr. Prince: John Gould's invaluable secretary. *Naturae*, 4: 1-23.

Limbert, M. (2007) A man called Dunn from Hull, prefacing facsimile of Dunn, R., *The Ornithologist's Guide to the Islands of Orkney and Shetland*. Peregrine Books, Leeds: 1-29.

Lubbock, B. (1937) *Arctic Whalers*. Brown, Son & Ferguson, Glasgow.

Macpherson, H.A. (1892) *A Vertebrate Fauna of Lakeland including Cumberland and Westmorland with Lancashire North of the Sands*. David Douglas, Edinburgh.

ʍcClintock, F.L. (1858) The Arctic Searching Expedition. *The Hull Packet and East Riding Times*, 19 November: 6.

ʍearns, B. & Mearns, R. (1998) *The Bird Collectors*. Academic Press, San Diego.

ʍoore, N. (1871) *Essays on Natural History by Charles Waterton, edited, with a Life of the Author*. Frederick Warne and Co., London.

ʍ[ullens], W.H. (1921) Obituary. Henry Wemyss Feilden. *Ibis*, eleventh series, 3: 726-728.

ʍullens, W.H. & Swann, H.K. (1917) *A Bibliography of British Ornithology from the Earliest Times to the End of 1912*. Macmillan and Co. Limited, London.

Newman, E.] (1849) *The Letters of Rusticus*. John Van Voorst, London.

ʍicholson, E.M. (1966) Obituary. Wilfrid Backhouse Alexander (1885–1965). *British Birds*, 59: 125–128.

ʼarker, J. (1851) Traces of Sir John Franklin. *The Hull Packet and East Riding Times*, 12 September: 8.

ʼarker, J. (1853) The Fishery – letter from the *Truelove*. *The Hull Packet and East Riding Times*, 14 October: 5.

ʼennington, M. (2004) The birdwatchers *in* Pennington, M., Osborn, K., Harvey, P., Riddington, R., Okill, D., Ellis, P. & Heubeck, M., *The Birds of Shetland*. Christopher Helm, London.

ʼinney, T. (ed.) (1999) *The Letters of Rudyard Kipling*, vol. 4 (1911–1919). University of Iowa Press, Iowa City.

ɩookmaaker, K. (2010) *Scientific Correspondence of Hugh Edwin Strickland in the University Museum of Zoology, Cambridge*. University Museum of Zoology, Cambridge.

alvin, O. (1882) *A Catalogue of the Collection of Birds Formed by the Late Hugh Edwin Strickland, M.A.* University Press, Cambridge.

auer, G.C. (1982) *John Gould, the Bird Man: a Chronology and Bibliography*. Henry Sotheran Limited, London.

auer, G.C. (1995) *John Gould, the Bird Man: Associates and Subscribers*. Maurizio Martino, Mansfield CT.

coresby, W. (1820) *An Account of the Arctic Regions, with a History and Description of the Northern Whale-Fishery*, 2 vols. Constable, Edinburgh.

harpe, R.B. (1906) Birds *in The History of the Collections Contained in the Natural History Departments of the British Museum*, vol. 2: 79–515. Trustees of the British Museum, London.

tonehouse, B. & Gunn, C. (2013) The Arctic whaling logs of Captain George Palmer, 1820–33. *Journal of the Hakluyt Society*, April: 1–10.

Villiams, R.B. (1993) The ephemera of collecting: species lists for use as labels. *Newsletter. Society for the History of Natural History*, 47: 7-8.

Villiams, R.B. (2004) John Van Voorst. Pp. 2063–2066 in Lightman, B. (ed.) *The Dictionary of Nineteenth-Century British Scientists*, vol. 4. Thoemmes Continuum, Bristol.

Villiams, R.B. (2012a) Biographical notes on the Hull taxidermist-dealer Robert Dunn, his son Joseph and other possible family members: newspaper gleanings. *The Naturalist* 137: 140-144.

Villiams, R.B. (2012b) Robert Dunn's 1837 *Ornithologist's Guide*: a study in printing and publishing history. *The Private Library*, sixth series, 5: 70-93.

Vilson, G. & Geikie, A. (1861) *Memoir of Edward Forbes, F.R.S.* Macmillan and Co., Cambridge and London.

arrell, W. (1839) *A History of British Birds*, 1st edition, vol. 1. John Van Voorst, London.

Appendix 1: eggs collected by Robert Dunn, held by the Natural History Museum (Tring)

For completeness, details are given here of eggs supplied by Robert Dunn and now in the ornithological collections of the Natural History Museum at Tring, Hertfordshire (NHMT). The following entries are extracted *verbatim* from the post-1906 egg accession slips (my notes in square brackets):

> 2 eggs of *Hydrobates* via Seebohm 1901.1.1.1376.
> Egg of *Catharacta* via Salmon 1947.16.109.
> Eggs of *Turdus iliacus* via Salmon 1947.16.20 (with letter from Robert Dunn quoted in cat.) [Salmon's own MS catalogue]
> Eggs of *Gallinago gallinago* 1901.1.1.5097.
> " " " " 1962.1.1307 (via Gould).
> " " " " 1979.1.13 via Waller. [?G.H. Waller (1880-1953?)]
> " " *Pluvialis apricaria* 1902.3.10.271-2 via Crowley. [Philip Crowley (1837-1900)]
> 1902.3.10.231-2 *Ch[aradrius]. dubius* via Crowley.
> 1901.1.1.6812 *Circus cyaneus* via Hargitt/Seebohm. [Edward Hargitt (1837-1900)]
> 1901.1.1.6821-4 " " " Seebohm.

The accession dates are sometimes several decades later than the acquisition dates. I examined some, but not all, of these specimens. Three eggs donated by John Gould and accessioned as "*Gallinago gallinago faeroeensis*. Shetland Islands. 1962.1.1307" are of some interest. Each egg bears "Common Snipe. R. Dunn. Helister [*sic*] Shetland" in black ink, in Dunn's hand. They are also labelled "GOULD" in red ink. Although there is no supporting documentary evidence of Dunn's having supplied these eggs directly to Gould, the existence of letters from Dunn to Gould (see previously) confirms that they knew each other.

Two eggs inscribed "Redwing" in Dunn's hand (*cf.* Fig. 1) are of more importance, donated to NHMT by John Drew Salmon along with his own manuscript catalogue. Salmon's catalogue records that Dunn collected these eggs himself in Norway during 1840 and sold them to Salmon for 2s. 6d. each in January 1841. Salmon also transcribed part of a letter dated 11 March 1841 that he received from Dunn (NHMT shelf-mark EGGS MS. SALMON, page 94).

The NHMT also holds the Milton Abbey School Egg Collection (NHMUK daybook 2001/137) of mixed and somewhat complicated provenance, which includes two swans' eggs supplied by Robert Dunn. Both are inscribed in Dunn's hand (*cf.* Fig. 1): "Rob^{t}. Dunn. Naturalist. Stromness. Orkney. Scotland". Each also bears a printed label, thus: "CYCNUS [*sic*] BEWICKII, *Yarr.* Bewick's Swan." or "CYCNUS [*sic*] MUSICUS, *Tem*. Hooper." Although undated, they must have been collected or obtained between c. March 1854, when Robert moved from Shetland to Stromness (Williams, 2012a), and July 1859, when he died (Limbert, *l.c.*). Note that he seems to have favoured the descriptor "naturalist" rather than "animal preserver" for his trade towards the end of his working life; indeed, he is described as a naturalist on his death certificate (Limbert, *l,c.*: endnote 3). Joseph apparently always described himself thus.

No details of specimens from either Robert or Joseph Dunn could be found in Sharpe (1906) but that book is nevertheless valuable in tracing ever wider networks of ornithologists and collectors centred on those known to have been associated with the Dunns. Eggs collected by the Dunns are, of course, likely to exist in other museums as, for instance, Robert's held by the Doncaster

Museum and Art Gallery (Common Gull *Larus canus*, accession no. 1963.658.74; and Black-headed Gull *Chroicocephalus ridibundus*, 1963.658.73), and Joseph's held by the Norfolk Museums & Archaeology Service (Limbert, *l.c.*: 8, and endnote 36).

Appendix 2: anecdotes from H.J. Elwes (1930)

References to Robert and Joseph Dunn occur in Elwes (*l.c.*). Additional information and page numbers are in square brackets.

> There was a certain ornithologist named [Robert] Dunn who then [c.1854, when Elwes was an eight-year-old in Tunbridge Wells] lived at Stromness in the Orkney Islands, who published a [printed?] catalogue of birds' eggs, which we studied with as much care and anxiety as any art connoisseur studies a sale list of pictures ... The eggs were sent by post packed in chip boxes, which sometimes arrived considerably broken, and great was the ingenuity displayed in mending up the broken eggs ... [Elwes recalled the price of a Great Northern Diver's egg being perhaps ten shillings.] [p. 14].

> In April, 1865 [aged nearly 20 years], before going up for the Army examination, I made my first independent expedition to collect birds in company with Mr. A. Crichton. We went to Stromness in Orkney and lodged with J. H. Dunn, the ornithologist, who collected birds and eggs for sale ... At Stromness I went out shooting in a small boat with Dunn whenever the weather allowed, and used to think that he was over cautious about the weather. But the strong tides and winds in Scapa Flow made boating more hazardous than I then thought, and we had one or two near shaves of being swamped. Dunn, with another companion, was drowned from his own boat some years afterwards on one of these excursions. [The other fatality was Dunn's boatman; their client survived (Anon, 1872a, 1872c).] [p. 23].

In one of the "near shaves" Elwes was, in fact, "nearly drowned during one of their expeditions in the very boat in which Dunn lost his life a few years afterwards" (Sharpe, *l.c.*: 345).

There is a manuscript catalogue of Elwes's egg collection (shelf-mark EGGS MSS. ELWES) in the Library and Archives of the NHMT. Listed therein are eggs taken by Joseph Dunn in the Orkneys between 1862 and 1864 as well as those of "*Vanellus cristatus*" (Lapwing), collected at Stromness by Elwes himself on 21 April 1865 during his expedition with Arthur William Crichton (1833-1882). According to Fuller (1999), Crichton was the brother-in-law of Lord Lilford (1833-1896), the bird collector and ornithological author (Mullens & Swann, *l.c.*: 352-356).

Appendix 3: anecdotes from T. E. Buckley & J. A. Harvie-Brown (1891)

Herein are references to Robert and Joseph Dunn and their acquaintances, copied *verbatim* from Buckley & Harvie-Brown (*l.c.*). Information derived directly from Robert Dunn's *The Ornithologist's Guide* is omitted but all other independent sources are noted. Background information is given in square brackets; terminal page numbers refer to Buckley and Harvie-Brown (*l.c.*).

> In 1837 R. Dunn published his *Ornithologist's Guide to the Islands of Orkney and Shetland*, which contains a very fair list of the mammals and birds, though there are one or two curiously strange omissions. If his statements are entirely to be relied on,

the avi-fauna of the islands has much altered within the last fifty years, as will be seen by a reference to the various species. Dunn was more of a collector than a naturalist, and, we are afraid, contributed not a little to the decimation of the rarer birds of both Orkney and Shetland. [p. xix]

We made inquiries as to whether any ornithological notes had been left by the late Joseph Dunn, and in this search we were much assisted by Mr. Eagle Clarke [William Eagle Clarke (1853-1938); see Mullens & Swann (*l.c.*: 131-135)] and Mr. Porritt [George Taylor Porritt (1848-1929)]. Correspondence with some of Dunn's relatives and intimate friends elicited the fact that there were no notes forthcoming, and as all his effects were sold and scattered after his wife's death [Catherine Gray Dunn died at Stromness, 27 July 1884 (Williams, 2012a)], if there ever were any they must have been lost. We found that others besides ourselves had been inquiring in the same direction, but apparently with no better results. This is a pity, as with Dunn's long experience of the Orkneys his notes must have proved of great interest. [p. xxii]

Mr. Cowan mentions that there was a Hoopoe in the late J. Dunn's collection, shot in Sanday. [pp. 133-134]

Dunn, the naturalist in Stromness, used to give 6d. each for the Hen-Harrier's and Short-eared Owl's eggs. Although this was cheap, adds Mr. Irvine-Fortescue, the natives thought it dear, and the birds decreased in consequence. [Since no date is given, this story may refer to Robert or Joseph. Likewise, Mr Irvine-Fortescue could have been either Archer Irvine-Fortescue (1819-1907) or his son William Archer Irvine-Fortescue (1851-1941), both of whom lived at Swanbister and served as Justices of the Peace for Orkney. On balance, it seems most likely that the informant was Mr Irvine-Fortescue, senior, and that Robert was the egg-dealer.] [p. 137]

Mr. Boyes [possibly Frederick Boyes (1842-1929); see Mullens & Swann (*l.c.*: 88)] informs us that when in Orkney in 1866, he saw a Marsh Harrier, stuffed, in J. Dunn's possession at Stromness, but got no particulars. [p. 141]

In a letter from Robert Dunn to T. C. Heysham, dated December 23d, 1844, he says:- "The Golden Eagles do not breed in Shetland that I know of at all. I know of *one pair* that breeds in Hoy." We have italicised this statement, as it bears out what we are trying to make good, viz., that only one pair of Golden Eagles bred in the Orkneys. Gray [apparently Robert Gray; see p. 148] was informed by J. Dunn, Stromness, that no Golden Eagles had bred in Hoy for a number of years, and that the only recent specimen procured there was one shot in 1857, and supposed at the time to be one of the only pair that had many years previously bred near Radwick (? Rackwick) on the west side of Hoy. [Thomas Coulthard Heysham of Carlisle was the son of John Heysham (see Mullens & Swann, *l.c.*: 294). Robert offered two Great Auk skins to Heysham in 1842 (Macpherson, 1892).] [p. 146]

Dunn told Groundwater [Andrew Groundwater of Linnadale] afterwards that if he ever shot another eagle [Golden Eagle *Aquila chrysaetos*] he would give him a guinea for it.

[Since its exact date is uncertain, this anecdote may have referred to Robert or Joseph.] [p. 147]

J. Dunn, writing R. Gray [presumably Robert Gray (1825-1887), mentioned on p. 146; see Mullens & Swann (*l.c.*: 248-252)], says, "Only one pair of Sea-Eagles have nested in Hoy for several years back; they are supposed to be very old birds, and unproductive. In 1865 their nest was got at, but was found to be empty, and, in the following year, their nest in another part of the cliffs was also reached, but found to contain one egg, and that an addled one." [p. 148]

Referring to the specimen mentioned by Messrs. Baikie and Heddle [this refers to Baikie & Heddle (1848)], we have received the following note: "Buffel-headed Duck. This is a mistake; the skin came from Dunn [before 1848, so probably Robert Dunn], and was not even killed in Great Britain." [p. 176]

Many [Surf Scoters *Melanitta perspicillata*] have been recorded in the *Field*, and we cannot do better than quote, *in extenso*, what has been written about these later Orcadian occurrences in the 4th volume of the 4th edition of Yarrell, pp. 482, 483:- "In the Orkneys, however, it seems to be of frequent and perhaps annual occurrence, from autumn to spring, although never in great numbers. An adult male was shot at Swanbister, in the parish of Orphir, in March 1866. One--perhaps the same specimen--was in the collection of the late Joseph H. Dunn, and another, which was doubtless killed in the Orkneys, is in the local museum at Stromness." [p. 184]

As far back as October 4th, 1851, J. H. Dunn obtained a nest containing eleven eggs [of Quail *Coturnix coturnix*], and it has since then been found breeding in other parts of the Mainland. [Joseph accompanied Robert to Shetland in 1835, when about eight years old (Limbert, *l.c.*) but this is perhaps the earliest specific date recorded so far of Joseph's collecting specimens on his own account. However he claimed to be "a practical collector & have been for more than <u>30</u> years" in a letter written in 1871 (Limbert, *l.c.*: 8), which would have made him younger than 14 years old when he began collecting with his father.] [p. 193]

Begg [Mr. Begg of Stromness], by the way, said that Dunn would not believe about the eggs being Turnstone's until he compared them with Norwegian examples that he had, and was then compelled to admit that they were genuine. [Apparently in 1860, so this must refer to Joseph.] [p. 205]

At page 90 of his *Rambles in the Orcades* [*sic*] Crichton [A. W. Crichton; see Mullens & Swann (*l.c.*: 155)] mentions one shot by Dunn from the carcass of a whale, in or about 1860. [This refers to a Glaucous Gull *Larus hyperboreus* shot by Joseph Dunn, actually in June 1860. Crichton hired Dunn as a guide on what appears to be little more than a shooting holiday and there are many mentions of his assistance in Crichton (*l.c.*), though nothing of intrinsic scientific importance.] [p. 234]

Calendar 2014

Up-to-date information can also be found on the YNU website at:
www.ynu.org.uk/events/general

Aug	22	YNU Entomology Section. Inkle Moor & Bell's Pond, Thorne Moors. Meet at 10:30 at the junction of Goole Road with Moorends Road (SE692163).
Sept	6-7	Nudibranch Identification Course at the Scarborough Campus of Hull University. A mixture of theory and practical sessions will include a visit to a local shore on Sunday morning. Cost £70, which includes course materials. For further information contact Paula Lightfoot on p.lightfoot@btinternet.com
	8-13	Conchological Society Field Meeting with the Conchological Society of Great Britain and Ireland and Seasearch. A week-long field meeting to record the Molluscan fauna of Yorkshire, with a particular focus on marine molluscs. Based at the University of Hull's Scarborough Campus where laboratory facilities will be available. There is no cost for attending the field meeting, but booking is essential. Participants are welcome to join for the whole week or just part of it.
Oct	4	Bryological section field meeting VC61, Wheldrake. Meet in the car park at SE690446 at 10:00.
	4	Joint Freshwater Ecology and Conchological section Field Meeting to the River Derwent at Low Hutton. Meet in car park on east side of railway near suspension bridge SE764677.
	10	Marine and Coastal Section joint meeting with the Cleveland Ironstone Mining Museum at Skinningrove. Meet at 9:15 at the Cleveland Ironstone Mining Museum (NZ712192) or on the shore at 9:45 (NZ718202). Everyone is welcome to join us on the shore, but space in the classroom is limited and places must be booked in advance via Jean Banwell on jean@ironstonemuseum.co.uk *Low water 0.40m at 11.45am.*
	11	Marine and Coastal Section. North Landing, Flamborough. Meet at 11:00 at the bottom of the slipway which leads down to the beach from the car park (TA239720). This is a joint field meeting with the Harrogate and District Field Naturalists' Society. For further information contact p.lightfoot@btinternet.com *Low water at 0.86m at 1.15pm.*
	18	Entomological Section AGM at Doncaster Museum, Chequer Road, Doncaster. 11:00 to 16:00.
	25	Conchological Section AGM at 17 West Park Drive, Leeds, LS16 at 13:00.
Nov	15	**YNU AGM, Malham Tarn Field Centre.** For details see p81.

YNU Entomology Section meetings - contact Bill Ely via billely@hotmail.com for further details.

Yorkshire Naturalists' Union

c/o NEYEDC, St William College, 5 College Street, York YO1 7JF
Tel: 01904 641631 Email: membership@ynu.org.uk
Website: www.ynu.org.uk
Registered Charity No. 224018

The Naturalist

his publication is issued free to individual members of the Yorkshire Naturalists' Union and to ffiliated Societies. The Editorial Board of *The Naturalist* is currently:

otice to contributors

ontributors should indicate whether they wish their manuscripts to be subjected to anonymous peer review. l other manuscripts will be reviewed by the Editorial Board who at their discretion may send them to third ırties for comment and advice.

riginal articles should be submitted electronically as an MS Word document to Dr A. Millard at millard@leedsmet.ac.uk.

ease look at a recent issue of the journal for a general idea of how to present your article. Also see *The aturalist Guide to Consistency* on p77 of *The Naturalist* 1079 and please **avoid** the following:

- using any paragraph formatting and line spacings other than single.
- using tabs to tabulate information (please use MS Word table format or separate the column entries in a single row with commas and enter a paragraph mark at the end of the row).
- inserting any figures, graphs or plates into the text; indicate their proposed locations in the text and send as separate files.

ood quality, high resolution images are very welcome and should be sent as .jpg files, with a separate MS ord file containing the caption and name of the person to whom the image should be attributed.

electronic submission is not possible, contributions should be sent to Dr. A. Millard, Woodland Villas, 86 ıchelor Lane, Horsforth, Leeds LS18 5NF (Tel. 0113 258 2482)

ontributors should ensure the accuracy of reference citations. The Editorial Board and Council accept no sponsibility for opinions expressed by contributors.

opy Dates:
pril issue - **14 February**; August issue - **14 June**; December issue - **21 August**

ISSN 0028-0771

Yorkshire Naturalists' Union

FSC www.fsc.org
DUFFIELD digital
Printed by Duffield Digital
www.duffieldprinters.co.uk

The Naturalist

mber 2014
ne 139
ber 1087

Yorkshire Naturalists' Union

al of Natural History for the North of England

The Naturalist

Vol. 139 No. 1087 December 2014

Contents

An asterisk* indicates a peer-reviewed paper

Front cover: Wild Tulips *Tulipa sylvestris* growing at Cattal (see p163). Photo: *Mike Chapman*
Back cover: A Scorpion fly *Panorpa* sp. found at Thorpe Marsh Nature Reserve during the VC63 excur (see p223). Photo: *Colin Rew*

Yorkshire Naturalists' Union

The Naturalist

December 2014 Volume 139 Number 1087

Dr Geoff Oxford FLS, President of the Union 2014-15

My earliest forays into natural history focussed on mammals when, as a lad, I used to wander the countryside around Warwick mapping Badger setts and catching mice and voles with a home-made 'Longworth' trap constructed from marine plywood and bits of Meccano. After a BSc in zoology at the University of Wales, Bangor, I moved to the University of Liverpool in 1968 to undertake a PhD. This was in the early days of using molecular markers (allozymes) to study evolutionary processes and I chose to work on the ecological genetics of 'area effects' in the snails *Cepaea nemoralis* and *C. hortensis* on the Marlborough Downs. After a year as a genetics research demonstrator at the University of Wales, Swansea, I was offered a lectureship in population genetics at the University of York where I remained until my retirement in 2009. This was a fortuitous appointment because in those days (early 1970s) the relatively new Department of Biology was an amazingly integrated unit with everyone knowing pretty well what everyone else was doing. Since I had very general interests across a broad sweep of biology this suited me down to the ground.

At first my research concentrated on enzyme variation in snails but it soon branched into disparate avenues, initially united within the general theme of how genetic variation in populations (balanced polymorphisms) could be maintained. For example, in collaboration with Terry Crawford and various students, we studied the distribution and origins of the radiate/non-radiate capitulum polymorphism in Groundsel *Senecio vulgaris* – a

phenomenon which, around York at least, proved to be curiously short-lived. During my PhD years I had become frustrated with the relatively tedious process of scoring molecular variation in snails (extraction, gel electrophoresis, staining, etc.) and I looked around for a 'hobby' project involving genetic differences that were more obvious. I homed in on the colour-polymorphic candy-stripe spider *Enoplognatha ovata*, thus initiating a three-decade-long study of the genetics and evolutionary implications of this variation, mostly conducted in Nidderdale, and a subsequent fascination with spiders. This eventually led on to research with colleague Rosie Gillespie (initially at the University of Hawaii, then UC Berkeley) on very similar variation in the endemic Hawaiian Happy-face Spider *Theridion grallator*. We showed that the genetics of some morphs of this exuberantly colour-polymorphic species differed between populations on the islands of Maui and Hawaii, suggesting major genetic shifts during founding events. While on sabbatical in Berkeley in 2005 I discovered another highly polymorphic species, *Theridion californicum*, which shares many of the same colour morphs with *T. grallator* and *E. ovata*, thus prompting an investigation into why unrelated species may have convergent colour patterns. In addition to work on polymorphisms I have examined distributions and speciation (including possible reverse speciation) in large house spiders *Tegenaria* spp. and initiated, with my wife, colleagues and students, studies of the ecology and conservation of the beautiful but endangered Tansy Beetle *Chrysolina graminis*.

Aside from research interests, I served on the Council of the Yorkshire Wildlife Trust for six years and on the Trust's education committee for many more. In the 1980s I took on the role of Yorkshire WATCH Organiser, a voluntary post within the YWT with the remit of encouraging the setting up of local WATCH groups across the county (WATCH was a national organisation run by the RSNC for young children interested in natural history). My wife and I ran our own WATCH group in York for almost a decade – a most inspiring and rewarding experience. Since the 1970s I have been a member of the Yorkshire Mammal Group (YMG), acting as chairman (twice) and for a number of years edited the Group's annual publication *Imprint*. For a decade I was involved with other YMG members in the annual monitoring of a re-introduced population of the delightful Hazel Dormouse *Muscardinus avellenarius* near Helmsley until, sadly, it became extinct. Over the last 10 years or so I have become increasingly involved with the British Arachnological Society, acting variously as vice president, president and, currently, honorary secretary. Encouraging a respect of, and fascination with, spiders – not the most endearing of groups – is to my mind extremely important and, to this end, I run one or two local workshops each year teaching adults how to catch, appreciate and begin to identify at least some members of our arachnofauna.

Wild Tulip in Yorkshire and Sweden

Linda Chapman
Email: lynneychapman@gmail.com

A shorter version of this article appeared in the *Wakefield & North of England Tulip Society Newsletter* 25 (2013).

The Wild Tulip *Tulipa sylvestris* is a bulbous perennial of open woodlands, orchards, hedgerows, riversides, chalk pits, grassy banks and waste ground. Populations can arise from discarded bulbs, deliberate planting in the wild or relics of cultivation. In Western Europe it is commonly found in orchards and vineyards where it thrives on disturbances to the soil. In such situations it is sometimes described as invasive. Wild Tulip also grows in woodland but, although it thrives, spreading rapidly by underground stolons, it rarely flowers well. It may grow in old churchyards, but again flowers little until these grounds are cleared and dug over, disturbance of the ground stimulating flowering. It grows some 35cm tall with bold clear yellow flowers and is tetraploid, having double the normal number of chromosomes, a factor which may account for its vigour.

The Wild Tulip's true origins are far from clear. Pavord (1999) suggests that it probably slipped into England in the reign of Elizabeth I (1558-1602) although, she states, it may have come earlier, possibly arriving with Flemish, Walloon or French refugees from 1540 onwards. It may have been brought over by the Flemish botanist Matthias de L'Obel (generally known as Lobelius) who travelled to London in 1570. Another consideration, noted by Daniel Hall (1929; 1940), is that the plant may even have been introduced by the Romans when bringing their vines to these shores.

According to Perring & Walters (1962), Wild Tulip was in cultivation in Britain by 1596. Formally much cultivated, it was first recorded in the wild in 1790. It appears to have been widely naturalised by the 18th and 19th centuries, but had declined dramatically by the time of the 1962 *Atlas of British Flora* (Preston *et al,* 2002) which shows fifteen recorded sites in Yorkshire, only three of them post-1970.

My own particular interest in this plant began in February 2013 when James Akers forwarded a copy of the *Yorkshire Naturalists' Union Bulletin,* issue 54. An article by Howes *et al.* lists the Yorkshire sites where Wild Tulip had previously been recorded, one of which is near Kirkbymoorside, a town about seven miles from my home. James' intent was that the information would give my recently retired husband the 'opportunity' to avoid rest, relaxation and boredom by getting out there and searching for the plant around Kirkbymoorside to try and add a 2013 record. In 1930 the estimated number of plants was 200-300, in 1979 it was reported that there were fewer tulips, and no plants at all were found in 2009. However, it was noted that as the land was permanent grassland "there is a possibility that the plants are still there". Unfortunately, try as we did, we found no sign of any plants near Kirkbymoorside.

Howes *et al.* (*loc. cit.*) also mentioned Wild Tulip growing at Cattal, a village located between York and Knaresborough. Wild Tulips have been recorded growing here since 1881. We visited

Cattal on 28 April 2013 and parked to the west of the village. Immediately we saw about 20 Tulips growing on the east side of the culvert, then a further 40 further down the west side of the culvert, approximately 10 in a hedge bottom and some individual specimens in the field. All the land where the Tulips were growing was adjacent to the River Nidd and it was apparent, from debris in the field, that the area had recently been flooded.

We took lots of photographs of the Tulips and returned to our car, satisfied with what we had seen (see Plate I, centre pages, and front cover). Malcolm Hainsworth happened to call the next day and, during discussion, realised that we had not visited what is recognised as the main site for the Tulips at Cattal. So, on 30 April, we returned and visited Aubert Ings, a designated SSSI in a loop of the meandering River Nidd to the east of the village. Here, there were no Tulips in the field adjacent to the Nidd. However, as we walked up the levee and looked down the river bank there were Tulips as far as we could see, literally hundreds of them. It was a truly remarkable sight and one that I had the opportunity to relate to our Swedish visitors after the Tulip Society's Annual Show. Talking to Anita Ireholm and Ulf Hannson it was apparent that they also had stories about the Wild Tulip. Ulf described it growing at Uppsala Botanic Gardens and also at Linnaeus' summer house at Hammarby. He also contacted Mariette Manktelow, at Uppsala University Botanical Garden, who told Ulf that Wild Tulip is found wild throughout the garden but that it shows mainly leaves and only the occasional flower. If the plants are from Rudbeck's original stock they can be dated to 1670–1680.

At Uppsala, a small Hortus Academicus was established in 1655 by Olof Rudbeck the Elder, a scientist and professor of medicine. This garden was the first botanic garden in Sweden and was originally called Rudbeck's Garden. His son, Olof the Younger, also became a professor and continued his father's studies. His best known student was Carl von Linné, better known by his latinised name Linnaeus, the man who devised our system of plant and animal nomenclature. Linnaeus would later name a genus of plants 'Rudbeckia' after the father and son (a later descendant of the Rudbeck family is Alfred Nobel, the originator of the Nobel Prizes). Linnaeus described *T. sylvestris* in 1753 in his *Species Plantarum*.

Between 1741 and 1778 the garden was under the directorship of Linnaeus, who was then Professor of Medicine. It became known as Linnaeus' Garden and was expanded considerably from Rudbeck's original design. By the end of the 18th century it had become very crowded and it often flooded. Consequently, a new garden was established and the old one abandoned, though it was restored in the 1920s; this restoration was undertaken to Linnaeus' original 1750s plan.

Linnaeus' summer house at Hammarby is one of the best preserved summer houses in Sweden. It is now a historic monument, museum and a sanctuary for surviving Linnaean plants. Only about 40 of the 900 varieties that Linnaeus may have had in the garden remain today, one of which is Wild Tulip, again mainly leaves but there is the occasional yellow flower in the spring sun. According to Ulf, the Wild Tulips here are almost certainly derived from the Botanical Garden at Uppsala.

References

Hall, D. (1929) *The Book of the Tulip*. Martin Hopkinson, London.

Hall, D. (1940) *The Genus Tulipa*. The Royal Horticultural Society, London.

Howes, C.A, Henderson, A. & Lambert, J. (2010) The Wild Tulip (*Tulipa sylvestris*): a preliminary review of the Yorkshire records. *YNU Bulletin* 54: 21-32.

Pavord,A. (1999) *The Tulip*. Bloomsbury , London.

Perring F.H. & Walters S.M., comps & eds (1962). *Atlas of the British Flora*. Thomas Nelson & Sons, London.

Preston C. D., Pearman D. A. & Dines T.D. (2002) *New Atlas of the British & Irish Flora*, Oxford University Press, Oxford.

Mothing in the Esk Valley

Graham Featherstone
email: graham_sharon@btinternet.com

Lealholm is a small village nestled in the Esk valley, surrounded by the North York Moors. The River Esk splits the village in half and runs eastwards for another 10 miles before entering the North Sea at Whitby. Just upstream of the village is the once famous Crunkley Ghyll, a steep-sided gorge with one of the few remaining blocks of ancient oak woodland with a typical understory carpet of Bilberry *Vaccinium myrtillus* and brambles.

Lealholm falls within the boundary of the Whitby Naturalists' Club and I have been recording the Lepidoptera of the area for the last 10 years. I regularly run a 40 watt actinic Heath trap in my back garden and the results have been quite spectacular. As this is such a rural garden I immediately saw all the commoner moths coming to the light. In the spring I am usually overwhelmed by the *Orthosia*s (e.g. Common Quaker and Hebrew Character), with sometimes over 100 individuals hiding amongst the egg boxes deposited in the bottom of the trap. As the season progressed I discovered that, if I placed the moth trap on the kids' 14ft trampoline, lots of moths attracted to the light would settle on the surrounding safety netting and it was quite simple to walk around the trampoline potting up any interesting moths to photograph or identify next morning. On 29th July 2010 I retained one such moth, a rather bland, brown micro which I could not put a name to. Photographs were taken and emailed to a good friend of mine and within minutes the phone rang and a rather excited fellow 'moth-er' told me that he thought my moth was a migrant Vagrant Piercer *Cydia amplana* and it would be a first for VC62. More photos were sent to 'the experts' and they confirmed its identity.

Living just 8 miles as the crow flies from the east coast, I am always hopeful of seeing a few migrant moths in my garden trap each year and on 27th August 2013 I was amazed to see the unmistakeable silhouette of a large hawk-moth on one of my tours of the trampoline. It was out of reach on the inside of the netting, meaning that I had to crawl onto the trampoline as carefully as possible, hoping not to disturb it. With great relief I secured it and saw straight away

in the beam of my headtorch that my prize was a wonderful migrant moth, none other than the scarce Bedstraw Hawk-moth *Hyles galii*. Next day, after photos were taken, the moth was released unharmed, flying strongly westwards into the last glows of the setting sun.

Not surprisingly, quite a few wandering moorland moths find their way into my garden trap. Golden-rod Brindle *Lithomoia solidaginis*, Heath Rustic *Xestia agathina* and the Brown Knot-horn *Pyla fusca* were all welcome additions to my garden list and one morning I saw the unforgettable sight of a female Emperor *Saturnia pavonia* in the light trap. I noticed that she had laid a batch of eggs, so these were carefully scraped into a container and posted off to a fellow enthusiast who managed to rear quite a few splendid adults from the eggs and had great fun using the virgin females to search several sites in Yorkshire for wild males which would assemble to them.

On 19th July I ran a mercury vapour lamp over a white sheet for a couple of hours in a local woodland. It was not a particularly successful evening with only 29 species of moth recorded, but one small Geometrid had me baffled so I retained an individual to identify next day. The moth was very well marked and was obviously a Barred Carpet *Perizoma taeniata*. Sutton and Beaumont's *Butterflies and Moths of Yorkshire* says that this moth was confined to just one site at Dibscar near Grassington. With more digging I was amazed to discover that the moth had actually been taken at the same location as mine in 1980. Later in the month I trapped a worn individual of the same moth in my garden too, possibly a wanderer from the local oak woodland not far from my village.

Mothing in any back garden can be quite fascinating, even addictive, as you just never know quite what is going to be in the moth trap each morning and I would encourage anyone with an inquisitive interest in natural history to either buy or build a moth trap and site it at the end of the garden. You won't be disappointed!

2014 sees me taking over as the Whitby Naturalists' Club's recorder of Lepidoptera and I am looking forward to helping members of the club in recording the butterflies and moths that can be found in this most varied of habitats, from the beaches on the coast to the nearby heather-clad moor tops. I am sure that there are many under-recorded sites with many fascinating moths just waiting to be discovered!

Editors' note: In addition to the YNU book mentioned above we would recommend the excellent website of the Lepidoptera section of the YNU (www.yorkshiremoths.info) for detailed information on all Yorkshire's moths, particularly the distribution maps and charts of seasonal occurrence.

Some records of tardigrades in Yorkshire

Barry Nattress, 25 West Lea Drive, Tingley, Wakefield, WF3 1DH
Mike Smith, 10 Moor Allerton Crescent, Moortown, Leeds, LS17 6SH
John Ramsbottom, 65 Laithe Hall Avenue, Cleckheaton, BD19 6UA

Introduction

Tardigrades, sometimes known as water bears, are microscopic animals 0.1mm-1.5mm long, usually transparent and with four pairs of stumpy legs (See Plate II, centre pages). They are to be found in marine, freshwater and terrestrial environments.

Tardigrades were included in the phylum Arthropoda prior to 1962 but since that date they have been allocated their own phylum – the Tardigrada (Ramazzotti, 1962). The phylum is split into two Classes, the Heterotardigrada and the Eutardigrada. The former is broken down into two Orders, the Arthrotardigrada, which includes all the typical marine species, and the Echiniscoida which, with one exception, are from terrestrial environments. The exception *Echiniscoides sigismundi* is to be found on some species of marine algae and within some barnacles and mussels. This Order also includes *Echiniscus,* a genus whose species are covered with sclerotized plates and distinctive cirri. The Class Eutardigrada comprises typical terrestrial species which lack the sclerotized plates, having an elastic, transparent cuticle.

Terrestrial tardigrades are found in a number of environments - in soil and leaf litter, in moss cushions, liverworts and lichens and also in freshwater. Whilst some marine tardigrades are found in deep water and are outside the scope of this paper, many are found within the intertidal zone, buried in the sand and living interstitially in the spaces between the sand grains.

Tardigrades cannot remain active without water and those that live in soil or moss cushions, etc., depend upon having a film of water around them. In consequence, they have developed the ability to survive extreme conditions in a dehydrated state, a condition known as cryptobiosis. In unfavourable conditions, the animal retracts its head and legs and forms a barrel-shaped tun (Kinchin, 1994; Nelson, 2001). As long as the desiccation is slow the animal will survive and return to active life once water returns.

There would appear to be few Yorkshire records of tardigrades. Morgan & King (1976), in their monograph on British Tardigrades, record just four species in Yorkshire, whilst Morgan (1976) adds but two more.

Methods

Samples of mosses, lichens, etc., were collected and stored with full site details including the national grid reference, in paper bags until ready for processing, usually within 48 hours. Each sample was soaked in water for about 24 hours and then squeezed into a petri dish.

The animals were then picked out individually with a pipette under a stereo-microscope and transferred to slides for examination.

Each leaf litter or soil sample was spread thinly on a sheet of supported single ply tissue in a tray (Greaves, 1989). Water was then added up to the level of the tissue. The sample was then left for a period of about 24 hours. The supported tissue and sample were then carefully removed and the water passed through a 50 micrometre sieve. The sieve was then back-flushed with distilled water into a petri dish. The tardigrades were then extracted as before.

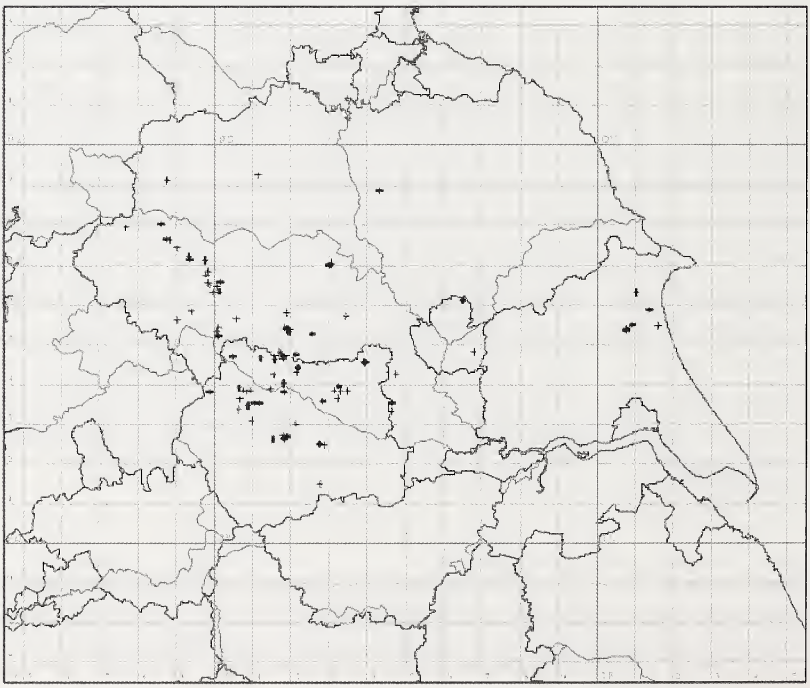
We did find specimens in two unusual places. We found one specimen in a heavy deposit of green algae growing on a tree trunk. Even more unusual, we found that almost 30% of the snail droppings we examined contained tardigrades (following Fox & Garcìa-Moll (1962)). It is unclear if they had passed through the gut of the snail or taken up residence at a later stage!

Once the specimens were on microscope slides they were examined with phase contrast at magnifications ranging from x200 to x800. Identification was achieved by using the keys in Morgan and King (1976) and subsequently Ramazzotti & Maucci (1983).

Any permanent slides of tardigrades were mounted in Hoyer's medium.

Figure 1. Positive sampling sites visited

VC61 to 65 Tardigrada Recorded Sites



Samples

210 samples were taken over a five year period commencing October 2008. Of these, 176 were from mosses, 19 from lichens, 1 from green algae removed from tree bark, 8 from soil, 1 from coniferous leaf litter, 2 from deciduous leaf litter, 3 from freshwater and 14 from snail droppings. 67% of these samples held tardigrades. Sampling sites were not evenly distributed around the county but were concentrated in the Leeds/Bradford area of West Yorkshire (Fig 1). Regrettably, none were in South Yorkshire.

Systematic Accounts

Taxonomic Note - some so-called 'species' are most probably groups of near identical species. This is indicated by the "cf" separating generic and specific names, e.g. *Hypsibius* cf *dujardini*.

† = new county record (recorded at the first named site)

* = new vice-county record (recorded at the first named site)

Family Batillpedidae

Batillipes acaudatus Pollock, 1971

*VC61: Filey Beach (TA1280) (Pollock, 1971).

†VC62: Described from Stoupe Beck Sands (NZ9503) (Pollock, 1971).

Batillipes phreaticus Renaud-Debyser, 1959

†VC61: Stoupe Beck Sands , J.S. Gray, 1971 (Gray & Rieger, 1971).

†VC62: Filey Beach, J.S. Gray, 1971 (Gray & Rieger, 1971).

Batillipes tubernatis Pollock, 1971

*VC61: Filey Beach (Pollock, 1971).

†VC62: Described from Stoupe Beck Sands (Pollock, 1971).

Family Echiniscidae

Echiniscus granulatus (Doyère, 1840)

†VC64: Halton Gill (SD8776), Arncliffe (SD9372), Grass Wood (SD9865).

Echiniscus testudo* var. *trifilis (Doyère, 1840)

*VC61: Skipsea Brough (TA1654), Gransmoor (TA1358).

†VC63: West Ardsley (SE2725), Hunsworth (SE1826).

*VC64: Skipton (SE0152), near Lotherton Hall (SE4635), Moortown (SE3138), Roundhay Park (SE3338), Sherburn in Elmet (SE4633), Tadcaster (SE4742).

Echiniscus testudo* var. *quadrifilis (Doyère, 1840)

†VC61: Gransmoor and Skipsea Brough,

Pseudechiniscus suillus (Eherenberg, 1853)

†VC64: Grass Woods, Arncliffe (SD9372), Coniston (SD9767), Grassington (SE0064), Halton Gill, Litton (SD9074), near Lotherton Hall and Yarnbury (SE0165).

Family Milnesiidae

Milnesium* cf *tardigradum Doyère, 1840

†VC61: Foston on the Wold (TA0955), Gransmoor.

*VC63: Tong (SE2130). Harden (SE0838).

*VC64: Moortown, Knaresborough (SE3457), Ribblehead (SD7679).

Family Hypsibiidae

Hypsibius* cf *dujardini (Doyère, 1840)

*VC63: West Ardsley (specimen removed from a snail dropping!), Queensbury (SE0931).

†VC64: Bradley (SE0048), C.I. Morgan, 1974 (Morgan & King, 1976), Esholt (SE1840).

Isohypsibius prosostomus Thulin, 1928

†VC63: Bradford (SE1633), C.I. Morgan (Morgan, 1976), Allerton (SE1035), Cleckheaton (SE1826), Hunsworth (SE1927), Tong, Queensbury.

*VC64: Arncliffe (SD9371), near Yockenthwaite (SD8682).

Ramazzottius* cf *oberhaeuseri (Doyère, 1840)

This was the second most common species we recorded.

†VC61: Brigham (TA0753), Burton Agnes (TA1063), Elvington Wood (SE6748), Foston on the Wold, Gransmoor, Hunsworth,

*VC62: Strensall Common (SE6461),

*VC63: Allerton, Bingley, Cliffe Castle (SE0639), West Ardsley, Wyke (SE1526), Queensbury.

*VC64: Burley in Wharfedale (SE1546), Esholt, Fewston Reservoir (SE1853), Grass Woods, Hawksworth (SE1542), Ilkley (SE1245), Moortown, Red Hall (SE3438), Skipton, Tadcaster.

Diphascon (Diphascon) alpinum Murray, 1906

†VC64: Coniston (SD9868), Fewston (SE1854).

Diphascon (Adroprion) prorsirostre (Thulin, 1928)

†VC64: Halton Gill.

Diphascon (Adroprion) scoticum Murray, 1905

†VC63 Stocksmoor Common (SE2715).

*VC64: Coniston.

Family Itaquasconinae

Astatumen trinacriae (Arcidiacono, 1962)

†VC64: Winterburn (SD9458).

Mesocrista spitzbergensis (Richters, 1903)

†VC64: Arncliffe, Grassington, Halton Gill and Litton.

Platicrista angustata (Murray, 1905)

†VC64: Halton Gill,

Family Macrobiotidae

Dactylobiotus dispar (Murray, 1907)

†VC64: Askham Bog (SE5748), J. Murray (as *Macrobiotus dispar*), 1907 (Morgan & King, 1976).

Macrobiotus* cf *harmsworthi Murray, 1907

†VC63: West Ardsley, Ardsley Reservoir (SE2824), Bingley, Chellow Dene Reservoir (SE1135).

*VC64: Swinsty Reservoir (SE1953).

Macrobiotus* cf *hufelandi Schulze, 1933

This was the most common species we recorded, found in almost every area we visited.

†VC61: Burton Agnes, Brigham, Gransmoor, Skipsea Brough.

*VC63: Ardsley Reservoir, Cullingworth (SE0636), Tong, West Ardsley.

*VC64: Ilkley (SE1246), Collingham (SE3945), Coniston, Fewston Reservoir, Grass Woods, Halton Gill, near Lotherton Hall, Silsden (SE0447), Sherburn in Elmet, Skipton, Swinsty Reservoir, Tadcaster, Yarnbury.

*VC65: Scotton (SD8791).

Macrobiotus macrocalix Bertolani & Rebecchi, 1993

†VC63: Allerton.

*VC64: Kettlewell (SD9771), Baildon (SE1438), Coniston.

Macrobiotus sandrae Bertolani & Rebecchi, 1993

†VC63: Denholme (SE0633), Hebden (SE0163), Tong.

*VC64: Yarnbury, Askwith (SE1748), Fewston.

Minibiotus intermedius (Plate, 1888)

†VC64: Fewston.

Paramacrobiotus areolatus (Murray, 1907)

†VC64: near Lotherton Hall.

Paramacrobiotus richtersi (Murray, 1911)

†VC61: Brigham,

*VC63: Tong, Cleckheaton, Oakworth (SD9838), Queensbury.

*VC64: Borrowby (SE4388), Askwith, Esholt, Fewston Reservoir, Ilkley, Knaresborough, Moortown, Ribblehead, Silsden, Skipton, Weston (SE1847).

Richtersius coronifer (Richters, 1903)

†VC64: Coniston, near Yockenthwaite.

Acknowledgments

We would like to thank Dr Lukasz Michalczyk, University of East Anglia, Dr Nigel Marley, University of Plymouth and Mr Phil Greaves of Chiddingfold, Surrey for their help and encouragement.

References

Bertolani, R. & Kinchin, I.M. (1993) A new species of *Ramazzottius* (Tardigrada, Hypsibiidae) in a rain gutter sediment from England. *Zoological Journal of the Linnean Society* 109: 327– 333.

Bertolani, R. & Rebecchi, L. (1993). A revision of the *Macrobiotus hufelandi* group (Tardigrada, Macrobiotidae), with some observations on the taxonomic characters of Eutardigrades. *Zoologica Scripta* 22(2): 127–152.

Degma, P., Bertolani, R. & Guidetti, R. (2014) Actual checklist of Tardigrada species (2009-2014, Ver. 24: 15-02-2014) available at: http://www.tardigrada.modena.unimo.it/miscellanea/Actual%20checklist%20of%20Tardigrada.pdf last accessesd Oct 2014.

Fox, I. & Garcìa-Moll, I. (1962). *Echiniscus molluscorum*, new tardigrade from the feces of the land snail, *Bulimulus exilis* (Gmelin) in Puerto Rico (Tardigrada: Scutechiniscidae). *The Journal of Parasitology* 48(2): 177–181.

Gray, J.S. & Reiger, M.R. (1971) A quantitative study of the Meiofauna of an exposed sandy beach, at Robin Hood's Bay, Yorkshire. *J. Mar. Biol. Ass. U.K.* 51: 1–19.

Greaves, P. (1989). An introduction to the study of tardigrades. *Microscopy* 36(3): 230–239.

Kinchin, I.M. (1994). *The Biology of Tardigrades.* Portland Press Ltd., London.

Morgan, C.I. (1974). Studies on the Biology of Tardigrades. PhD Thesis, University of Wales.

Morgan, C.I. (1976) Studies on the British tardigrade fauna. Some zoogeographical and ecological notes. *J. nat. Hist.* 10: 607–632.

Morgan, C.I. & King, P.E. (1976). *British Tardigrades.* Synopses of the British Fauna (New Series) No.9, Linnaean Society of London, Academic Press.

Murray, J. (1907). Scottish Tardigrada collected by the Lake Survey. *Transactions Royal Society Edinburgh*. 45: 641–668.

Nelson, D.R. (2001) Tardigrada *in* J.H. Thorp & A.P. Covich (eds) *Ecology and Classification of North American Freshwater Invertebrates*. 2nd edn. Academic Press, New York: 527–550.

Pollock, L.W. (1971). On some British marine Tardigrada, including two new species of *Battilipes*. *J. Mar. Biol. Ass. U.K.* 51: 93-103

Ramazzotti, G. (1962). Phylum Tardigrada. *Memorie dell'Instituto Italiano Idrobiologia*. 16: 1–595

Ramazzotti, G. & Maucci, M. (1983) Il Phylum Tardigrada, 3rd Edn. (C. W. Beasley, English Translation, 1995). *Memorie Dell'Instituto Italiono di Idrobiologia* 41: 1-1012

Editors' note: We recommend the Wikipedia article on Tardigrades as a good introduction to the detailed aspects of their biology, including their tolerance of extreme environmental conditions. (http://en.wikipedia.org/wiki/Tardigrade)

The dolichopodid flies of North Cave Wetlands, a former sand and gravel quarry

Roy Crossley 1 The Cloisters, Wilberfoss, York YO41 5RF
email: roycrossley@btinternet.com

Introduction

Since the Yorkshire Wildlife Trust acquired North Cave Wetlands in 2000 a huge amount of landscaping and habitat creation has been undertaken with the principle objective of attracting birds and making them accessible to the general public as well as the serious bird-watcher. That this work has been hugely successful is readily apparent, with regular breeding birds including Little Grebe *Tachybaptus ruficollis* and Great Crested Grebe *Podiceps cristatus*, Oystercatcher *Haematopus ostralegus*, Avocet *Recurvirostra avosetta*, Little Ringed Plover *Charadrius dubius*, significant numbers of Black-headed Gull *Chroicocephalus ridibundus* and both Sedge Warblers *Acrocephalus schoenobaenus* and Reed Warblers *A. scirpaceus*.

Sand and gravel extraction is still proceeding in the immediate vicinity and is expected to do so until the early 2020s. As these areas become worked out they are taken into conservation management and thus the reserve is regularly being extended. At the end of commercial operations it is expected that North Cave Wetlands (hereafter 'NCW') will be one of the most important and varied nature reserves in the East Riding of Yorkshire. For a full account of its history and development to date see Ashforth & Dayes (2011) and also the comprehensive reserve website (www.northcavewetlands.com).

Quarrying has introduced an entirely new series of habitats to the low-lying plain which was previously under agricultural management, having been farmed for cereals, root-crops such as sugar beet and potatoes and with smaller areas of permanent pasture. Over the past twenty or so years many varied habitats have been created and superseded, and this process is on-going. These offer unique opportunities for naturalists to study the colonization and succession of plants and invertebrates in an ever-changing sequence of environments.

This paper is an account of some of the dolichopodid flies which have been recorded at NCW since my first survey in 2007. Dolichopodidae have recently been the subject of a short paper in *The Naturalist* (Crossley, 2014) and the flies need no further description here. 67 of the 238 Yorkshire dolichopodids (out of a British total of 300) have now been recorded at NCW. It is of interest to note that Askham Bog, which in 1946 was the first reserve to be acquired by the Trust, has a list of 60 species which have been recorded over a period of eighty years, although not all are common to both reserves.

To some extent species diversity reflects recording effort: the more site visits that are made the more likely it is that the species list for any group of organisms will be greater than for an area which has received less attention. Likewise a locality which contains a range of macro and/or micro-habitats is likely to support a wider variety of species than an area of uniform habitat. There are many variables and imponderables but this account of a recently created and dynamic site is offered in the hope that it may encourage others to undertake similar studies.

Notes on the Species List

In the following account nomenclature follows Chandler (1998) (with up-dates) and national statuses follow Falk and Crossley (2005). References to Yorkshire status and occurrences are based on the records of the Yorkshire Naturalists' Union, which stretch back for more than a century. A complete species list is appended.

Many dolichopodids are associated with wetland habitats where the larvae are thought to develop as predators in mud or silt, and it is therefore to be expected that the margins of the lagoons at NCW are the most productive for these flies. Access to the water bodies at NCW is very restricted in the early part of the flight period of many dolichopodids in order to avoid disturbance to nesting birds. However, it is possible to carry out brief collecting activity at a few locations and the extreme south-east of Village Lake near the entrance to the Reserve is available throughout the season in most years, and this area has proved to be very productive. Noteworthy dolichopodids recorded in that area include *Melanostolus melancholicus* with a single female found in July 2008. It was first recorded in Yorkshire in 1996 at Sand Dale on the southern edge of Dalby Forest and also at Forge Valley. The following year several specimens were found at seepages on Sewerby Cliffs north of Bridlington and it has also been recorded from Hatfield Moor (Skidmore, 2006). Although a small fly (c.2.5mm), it is not likely to have been overlooked in the past and prior to 1970 there were only two known British records. Since 1974, when it was found at Earith Gravel Pit (Hunts.), there have been more than ten records nationally and the species is now accorded Lower Risk (Nationally Scarce) status.

In July 2008 a single male *Dolichopus agilis* was found at the Village Lake site. This too is a Lower Risk (Nationally Scarce) species, with only three records on the YNU cards, the first (if correct), from 1886 being one of the earliest Yorkshire dolichopodid records. The locality given is simply 'Bradford', with the attribution 'R.H.Meade', a pioneer Yorkshire dipterist and arachnologist. The next was from Allerthorpe on 2 July 1927, with a note in the hand of C.A.Cheetham 'Given to Collin'. J.E.Collin was a leading British dipterist of international standing in the first half of the 20th century, and it is apparent from the YNU record cards that, from time to time, both Mr Cheetham and Dr Fordham sought his opinion on their identifications. In 2009, at my request, my colleague Adrian Pont kindly examined the specimen, which is in the Verrall-Collin collection

at Oxford University Museum of Natural History. Mr Pont reported (*in litt.*) that it was on a short pin with one of Collins' disc labels with the following data on the underside 'Allerthorpe/2.7.27/Cheetham'. Mr Pont has staged it up on a plastazote mount and turned the data label the right way up so that it can now be read without handling the specimen. Oh that all historic records could be verified so easily! There is a further Yorkshire record from Blacktoft Sands RSPB reserve in July 1980 from material obtained in water traps by Andrew Grieve during an invertebrate survey and identified by the late Dr Peter Skidmore.

Unsurprisingly, *Dolichopus* species are well represented at NCW, with 17 of the 40 Yorkshire members of the genus having been recorded. Apart from *D. agilis*, the remainder are mostly common and widespread across the County, although *D. claviger* and *D. nubilis* have a distinctly southern/eastern bias in their Yorkshire distribution and some others are rather localized. At NCW *D. plumipes* and *D. ungulatus* are found widely across the reserve, reflecting their status as being amongst the most common and widespread of dolichopodids generally.

In complete contrast, representatives of the similar genera *Gymnopternus* and *Hercostomus* are largely unrecorded at NCW. Two male *G. silvestris* swept from grassland between Carp Lake and Main Lake on 29 June 2013, and a single female *H. fulvicaudis* in the same general area on 26 July 2008, are the only representatives of these genera noted to date, which is quite astonishing and inexplicable at present. *G. silvestris* was described 25 years ago (Pollet, 1990); it is very similar to the widespread but rather localised *G. assimilis*, with which it may have been confused in the past. It was first reported in Yorkshire from Low Wood, Hornsea, in 1996 and thereafter from a number of lowland sites in the county.

H. fulvicaudis is a Lower Risk (Nationally Scarce) insect which was first reported from Yorkshire in 1978 when two males and two females were found in water traps during survey work at Blacktoft Sands RSPB reserve. I found a single female on the tidal Humber bank at Redcliff near North Ferriby in 2012, and in 2013 Ian Andrews recorded a pair from the edge of a reed-bed near Broomfleet, again on the Humber bank. In late June 2014 I sought it at the edge of reeds bordering the Humber flood bank between East Clough and Welton Waters and found a single female at the former site and singles of both male and female at the latter. The 1978 Blacktoft specimens need to be re-examined as a very similar species, *H. rothi* (Zett.), has recently been found in Britain (Drake *et al*, 2013).

Two species of *Tachytrechus, T. insignis* and *T. notatus*, have been recorded at NCW. My first encounter with *T. insignis* was in 1994 when I found numerous specimens on bare sand at Little Paxton Gravel Pits in Cambridgeshire. In August 2001 I found the first to be reported in Yorkshire on bare wet sand at the side of a brackish dyke at Beacon Ponds, Kilnsea, where several examples of both sexes were present. A single female was found at NCW in the south-east corner of Village Lake on 4 September 2007, and four years later it was abundant along the bare, sandy edges of the newly created drainage system at Dryham Ings. In 2014 examples of both sexes were found in a similar habitat in the most recently developed site (Cell A) at Dryham Ings. Indications are that this dolichopodid is an early coloniser and it may become extinct at NCW as its specialised habitat disappears. It is also reported from Hatfield Moors (Skidmore, *loc. cit.*).

Tachytrechus notatus is much more widely distributed in Yorkshire, although very local, with records from ten sites. Habitats include high altitude Pennine moorland and sandy sea-cliffs at Reighton and at Sewerby, where I found it in abundance at the latter site in July 1997 on wet sand and mud at the base of the cliffs. At NCW it has been found on the shore at Village Lake and also on the margin of Island Lake.

Seven of the nine British species of *Hydrophorus* are recorded in Yorkshire and four of these occur at NCW. The three Yorkshire species that have not been recorded here are *H. atriceps, H. nebulosus* and *H. oceanus*. *H. atriceps* is mainly found at moorland peat-bogs, with occurrences also at lowland peat sites such as Thorne Moors and Skipwith Common, and *H. nebulosus* has a similar distribution. *H. oceanus*, as its name suggests, is a coastal/salt-marsh dolichopodid with all Yorkshire records confined to sites along the Humber; none of these three are likely to occur at NCW but one never knows! Of the remainder, *H. balticus*, *H. bipunctatus*, *H. litoreus* and *H. praecox* have all been recorded on the south-east shore of Village Lake and all but *H. praecox* have been found at other lake-side sites. Historic Yorkshire records for most *Hydrophorus* species are few, and the paucity probably reflects collector interest rather than any comparatively recent spread. For example, the widespread *H. bipunctatus* was first noted in Yorkshire from Spurn during the YNU Entomological Section survey of that area in the early 1950s. The next report was from Thorne Moors in 1982, since which date it has been recorded in nearly thirty 10km squares across the County. *H. litoreus* is the least reported of the NCW quartet, with the first Yorkshire record from Helwith Moss in 1936 and being recorded again in 1940. It was then reported from Spurn in 1946 and there were no further reports until 1986 when it was found at Denaby Ings. Since then there have been records from about a further fifteen sites in eleven 10km Yorkshire squares.

Three species of *Rhaphium* call for special mention. *R. consobrinum* is primarily associated with coastal salt-marshes and river banks and it is currently recorded from eleven Yorkshire 10km squares, having been first reported in the County in 1975 at Blacktoft Sands RSPB reserve. The first Yorkshire report of *R. laticorne* was from Acaster Malbis in 1985 and it has since been found at a further nine lowland localities, including Hay-a-Park gravel pits at Knaresborough. *R. rivale* is a Lower Risk (Nationally Scarce) insect which was first recorded in Yorkshire in 1983 at Timble Ings near Otley. Further reports have been from river banks, including the River Don at Rotherham, the Calder at Cromwell Bottom near Elland and well-worked riparian sites in lower Wharfedale. It has been recorded to date from a total of seven 10 km squares across the County.

Three species of *Sciapus* have been recorded at NCW. *S. longulus* appears to be restricted to the eastern half of Yorkshire and, although members of the genus usually occur on arboreal vegetation, *S. longulus* can often be found on coastal vegetation such as salt-marsh grasses, the first County record being from Spurn in 1953. *S. platypterus* is widespread and common across Yorkshire in a variety of habitats and its occurrence at NCW is not unexpected. *S. wiedemanni* was swept from tree foliage at the south-east corner of Carp Lake in 2007. Yorkshire records for this dolichopodid go back as far as 1922 (Skipwith) but, apart from Austwick (VC64) in 1931 and Spurn (1953), all records are from sites in a cluster of 10km squares in the western part of VC61 and the Thorne/Hatfield area of VC63. As the majority of post-1990 records are attributed to the author one could speculate that this is a classic case of 'collector bias'!

Campsicnemus marginatus is usually associated with sand and shingle-banks beside fast-flowing upland rivers, the first Yorkshire record being from the River Wharfe at East Keswick Fitts in 1984. Since then it has been found sparsely on a number of river banks in the north and west of the County but with no records yet from VC63, and only NCW in VC61. It is interesting to note that *C. marginatus* has been recorded at Hay-a-Park gravel pits and Nosterfield gravel pit (West Tanfield), but both sites are fairly close to major rivers. At NCW the damp, sandy shore-line of Village Lake is similar to the more usual riparian habitat of this species, but one does wonder how it got there! Most Yorkshire records of *C. picticornis* are from lowland sites in eastern and southern parts of the County and the occurrence of this tiny dolichopodid at NCW is not unexpected, but it is interesting that it was not found until 2013, at the margins of both Village Lake and Island Lake.

Micromorphus albipes is a dull, greyish and minute (c.1.5mm) dolichopodid. It occurs at NCW, sometimes in large numbers, chiefly on dry ground with colonizing short turf, such as on the slopes surrounding Village Lake. It is known that there are several species masquerading under this name and awaiting description, which will be mainly determined on genitalia differences in the male. It is wise to retain a series of specimens for possible future study; in the meantime the present name stands.

Syntormon monile was first discovered on the margin of Village Lake in 2009 and at Island Lake the following year. There are numerous widespread but localized Yorkshire records of this species (then known as '*monilis*'), with the first being from Austwick in 1921. About twenty years ago dipterists were alerted to the presence of two forms of this species in Britain (Hodge, 1993), but it was some years later that a paper describing one of these forms, named *S. silvianum* (Parvu, 1989), came to general attention in this country. As a consequence, examples determined prior to 2001 may be of either species (i.e. *monile* or *silvianum*) and, in the absence of voucher specimens, all earlier records of '*monilis*' should be regarded as suspect. Subsequent to 2001 *S. silvianum* has been found to be more widespread in Yorkshire than *monile*, the latter now being regarded as much more localized. However, the status of these two is still a cause for dispute and the matter may not yet have finally been resolved (Parvu, 2009; Grichanov, 2013).

The publication by the Royal Entomological Society of the key to Dolichopididae (Assis Fonseca, 1978) gave impetus to the study of the family, and this no doubt accounts for the surge of Yorkshire records since the early 1980s. In that work only two species of *Xanthochlorus* are noted: *X. tenellus* and *X. ornatus*. In 1987 attention was drawn to the presence of a third (probably undescribed) in Britain (Dyte, 1987). However, it was not until much later that the matter was resolved (Chandler & Negrobov, 2008). As a result, four species are now known to occur in Britain. It is likely that many records of *X. tenellus* refer to the new species *X. galbanus,* and, in the absence of voucher specimens, records of *tenellus* prior to 2008 should be ignored. Specimens are usually swept from tree foliage, and this has been the case at NCW.

Chrysotus suavis and *Chrysotimus molliculus* are recent (2014) noteworthy additions to the NCW dolichopodid list. The first Yorkshire record of *C. suavis* was from Nosterfield gravel pit in 1998 and then from Redcliff on the tidal Humber bank near North Ferriby in 2005. The following year it was reported from both Thorne and Hatfield Moors (Skidmore, 2006). In 2013 there was a further record from the Humber bank up-river from the Redcliff site. Assis Fonseca (1978) refers

to *C. suavis* as a 'sea-coast species, scarce and very local', and the Thorne and Hatfield records refer to its occurrence in 'brackish' situations. At NCW specimens were found on the sparsely vegetated sandy margins of shallow drainage channels on the most recently developed areas of Dryham Ings (Cells A and B).

Chrysotimus molliculus is also tiny (c.2mm) and it exhibits sexual dimorphism, the males being entirely bright green and the females having bright yellow abdomens. Specimens are usually found by sweeping the foliage of trees and shrubs. First reported in Yorkshire from Millington in 1936, it was next recorded from Wheldrake Woods in 1998, after which it has been found in a further ten, mostly lowland, localities in the County.

Discussion

Thirty years ago the lagoons, their immediate surrounds and all the other ever-changing habitats that make up the complex of environments at today's North Cave Wetlands, were under agricultural management, mostly as arable farmland. Then came the extractive industry, leaving behind a post-industrial landscape. This is now being actively managed primarily for the benefit of birds, but this study clearly demonstrates that other colonizing animal groups are of conservation interest. As always in these situations the most obvious question is how do the many 'new' species get there? At NCW there are, *inter alia,* flies primarily associated with coastal habitats and at least one which is associated with upland river systems. One possible answer is that they may form part of the aerial plankton caught up and blown along by the wind – those which escape the attention of hunting hirundines and other avian predators might drift down and, finding a suitable habitat, settle for a while and establish a breeding population until the habitat changes over time and they then die out. Others may be purely transitory and their detection due entirely to serendipity!

Acknowledgements

The author is responsible for all the NCW records quoted herein but thanks are due to the many entomologists who, over the years, have contributed to the Yorkshire Naturalists' Union records, and thus helped build up the general fund of knowledge regarding insect distribution in the County. Stephen Martin gave much practical advice on site and facilitated access to sensitive areas, as well as providing much information on the development of the NCW reserve. Officers of the Yorkshire Wildlife Trust have been supportive of this study and Dick Brown provided me with valuable information on land-use prior to the development of the quarries.

References

Ashforth, M. & Dayes, G.(eds) (2011). *North Cave Wetlands: the First Ten Years*. North Cave Wetlands Local Management Group, North Cave.

Assis Fonseca, E.C.M.(1978). Diptera Orthorrhapha Brachycera. Dolichopodidae. *Handbk. Ident. Br.Insects* IX. (5), 1-90.

Chandler, P.J. (1998). Checklists of Insects of the British Isles (New Series), Part 1: Diptera. *Handbk.Ident.Br.Insects* 12 (1): 1-234.

Chandler, P.J. & Negrobov, O.P. (2008). The British species of *Xanthochlorus* Loew, 1857 (Diptera, Dolichopodidae), with description of two new species. *Dipterists Digest*, *(Second Series)* 15, 29-40.

Crossley, R. (2014). Notes on the distribution and habitat associations of dolichopodid flies in

Yorkshire. *The Naturalist* 139: 108-111.

Drake, C.M., Crossley, R., Smith, M.H & Pollet, M. (2013). *Hercostomus rothi* (Zett.) (Diptera, Dolichopodidae) stat.nov., new to Britain. *Dipterists Digest (Second Series)* 20: 121-130.

Dyte, C.E. (1987). A third British species of *Xanthochlorus*. *Empid and Dolichopodid Study Group Newsheet* 34.

Falk, S.J. and Crossley, R. (2005). A review of the scarce and threatened flies of Great Britain. part 3: Empidoidea. *Species Status* 3: 1-134. JNCC, Peterborough.

Grichanov, I.Y. (2013). Systematic Notes on West-Palaearctic Species of the Genus *Syntormon* Loew (Diptera:Dolchopodidae) pp. 3-26. *in* Grichanov, I.Y., Negrobov, O.P., Chursina, M.A., Maslova, O.O., Selivanova, O.V. Fauna and taxonomy of Dolichopodidae (Diptera), Collection of papers. *Plant Protection News Supplement*. All-Russian Institute of Plant Protection RAAS. ISSN 1815-3682 St.Petersburg.

Hodge, P..J. (1993). Two species of *Syntormon* confused under the name *S.monilis* (Haliday). *Empid and Dolichopodid Study Group Newsheet* 12: 3.

Parvu, C. (1989). New contribution to the knowledge of Dolichopodidae (Diptera) of Romania (VI) with the description of two new species: *Syntormon silvianus* n.sp. and *Asyndetus negrobovi* n.sp. *Travaux du Museum National d'Histoire Naturelle <Grigore Antipa>* 30: 57-65.

Parvu, C. (2009). *Syntormon monilis* (Haliday, 1851) and *S.silvianum* Parvu, 1989 (Diptera:Dolichopodidae) *Travaux du Museum National d'Histoire Naturelle <Grigore Antipa>*, 52: 293-295.

Pollet, M. (1990). Phenetic and ecological relationships between species of the subgenus *Hercostomus* (*Gymnopternus*) in western Europe with the description of two new species (Diptera:Dolichopodidae). *Systematic Entomology* (1990) 15: 359-382.

Skidmore, P. (2006). *An Inventory of the Invertebrates of Thorne and Hatfield Moors. Thorne and Hatfield Moors Monograph No.2*. Thorne and Hatfield Moors Conservation Forum, Doncaster.

Appendix 1

Systematic list of Dolichopodidae recorded at North Cave Wetlands, 2007-2014.

Argyra argentina (Mg.)
A.argyria (Mg.)
A.diaphana (Fab.)
A.perplexa Beck.
Chrysotus cilipes Mg.
C.femoratus Zett.
C.gramineus (Fall.)
C.neglectus (Wied.)
C.suavis Lw.
Diaphorus nigricans Mg.
Melanostolus melancholicus (Lw.)
Dolichopus agilis Mg.
D.brevipennis Mg.
D.campestris Mg.
D.claviger Stann.
D.festivus Hal.
D.griseipennis Stann.
D.latilimbatus Macq.
D.lepidus Staeg.
D.linearis Mg.
D.longicornis Stann.
D.nubilus Mg.
D.plumipes (Scop.)
D.popularis Wied.
D.simplex Mg.
D.subpennatus d'Assis-Fonseca
D.trivialis Hal.
D.ungulatus (L.)
Gymnopternus silvestris Pollet
Hercostomus fulvicaudis (Hal. in Walker)
Poecilobothrus nobilitatus (L.)
Sybistroma obscurellum (Fall.)
Tachytrechus insignis (Stann.)
T.notatus (Stann.)

Hydrophorus balticus (Mg.)
H.bipunctatus (Lehmann)
H.litoreus Fall.
H.praecox (Lehmann)
Scellus notatus (Fab.)
Medetera jacula (Fall.)
M.truncorum Mg.
Microphor holosericeus (Mg.)
Rhaphium brevicorne Curtis
R.caliginosum Mg.
R.consobrinum Zett.
R.elegantulum (Mg.)
R.laticorne (Fall.)
R.rivale (Lw.)
Sciapus longulus (Fall.)
S.platypterus (Fab.)
S.wiedemanni (Fall.)
Campsicnemus curvipes (Fall.)
C.marginatus Lw.
C.picticornis (Zett.)
C.scambus (Fall.)
Chrysotimus molliculus (Fall.)
Micromorphus albipes (Zett.)
Sympycnus aeneicoxa (Mg.)
S.desoutteri Parent
Syntormon denticulatum (Zett.)
S.monile (Hal. in Walker)
S.pallipes (Fab.)
S.pumilum (Mg.)
Teuchophorus monacanthus Lw.
T.spinigerellus (Zett.)
Xanthochlorus galbanus Chandler & Negrobov
X.ornatus (Hal.)

Field Note: Intra-specific killing in Great Black-backed Gull

Roy Crossley: e-mail: roycrossley@btinternet.com

At about 15:10 on the afternoon of 3 December 2013, whilst bird-watching at North Cave Wetlands YWT reserve, my attention was attracted to a commotion on the water at Dryham Ings (Cell A), some distance in front of Crosslands hide. Closer inspection revealed two adult Great Black-backed Gulls *Larus marinus* engaged in a tussle on the water c.100 yards away. The birds were repeatedly stabbing at each other and also holding and pulling heads by placing the upper mandible at the upper part of the nape and the lower mandible at the throat. This was accompanied by much wing flapping as they moved around on the water.

This activity lasted without ceasing for the next twenty minutes or so, by which time one of the two had become dominant and was holding the head of the other tightly and shaking it, interspersed with occasional jabs, and drawing blood. The victim's wing-flapping became increasingly feeble and finally ceased, at which point it gave up the fight and floated on the surface. There it remained, apparently lifeless, and the victor swam away.

The following week I reported my observation at a meeting of the York RSPB Local Group and Barry Bishop told me of an almost identical occurrence which he had witnessed at North Cave Wetlands on 5 August 2013 when gulls were coming in to roost. Two adult Great Black-backs fought on a small island in the deep-water lagoon immediately west of Crosslands hide, one of them eventually being killed.

Subsequently Keith Rotherham told me that he, too, had witnessed a fight between two adult Great Black-backed Gulls on the afternoon of 16 November 2011 at North Cave which had ultimately resulted in the death of one. In this instance the contest took place on the water of Main Lake and lasted for three hours, the loser being eventually drowned. After death the victor dragged the corpse to the bank where it continued to peck at the head of the dead bird, eventually decapitating it, and then it left the scene. At times during the fight one of the birds flew into the air and dropped on to the back of the other. Michael Bayldon has also told me that he witnessed a fight between two adult Great Black-backs at North Cave Wetlands in 2012 which ended in a fatality, but on this occasion the event took place on one of the dry banks. I have also heard of one further report of an attack at North Cave Wetlands within the past year or so, leading to the death of a Great Black-back Gull, but with no details.

There are reported instances of Robins *Erithacus rubecula* killing other Robins, and John Coldwell tells me that he once saw a Magpie *Pica pica* kill another Magpie in his garden feeding area. Similar acts no doubt occur in other birds, but I can find no published reference to this for the Great Black-backed Gull, although it is a well-known predator of other birds and mammals. At least five instances of intra-specific killings at North Cave Wetlands within the past two years lead one to suspect that the same individual may have been implicated in all cases.

I am obliged to those colleagues mentioned who have kindly agreed to their observations being included in this note, and also to Dr John Mather who suggested publication and made helpful comments on the first draft.

One day in June – a snapshot of decline

Nick Morgan Linden, Ainderby Steeple, North Yorkshire DL7 9PU
Email: nickmlinden@gmail.com

Like many naturalists there is a little of Gilbert White in me - a particular passion for the natural history of my home parish, Ainderby Steeple in North Yorkshire (VC65). Whilst searching for any historic bird records for the village I saw reference to a YNU excursion to Ainderby. Thanks to the efficient offices of the YNU Webmaster and the Honorary Librarian copies of both the circular advertising the event and the report of the visit in *The Naturalist* were located. The visit took place on 22 June 1946 and the advice for attendees included a recommendation for rubber thigh boots and the warning that Ainderby Bottoms was home to a "particularly vicious gnat, the full effect of whose attentions are delayed". Perhaps most surprisingly, it appears that the bus services are more frequent now than in 1946!

However, the overwhelming feeling, particularly for a local birdwatcher, is one of melancholy at the loss of what must have been tremendous habitat and a much richer avifauna. The ornithological list includes no fewer than thirteen species that no longer breed in the village:

Teal *Anas crecca* – Now only recorded as an uncommon winter visitor.

Snipe *Gallinago gallinago* – Although the odd pair has stayed to late spring there have been no confirmed records of breeding for some years.

Redshank *Tringa totanus* – Now reduced to a less than annual passage migrant through the parish.

Black-headed Gull *Chroicocephalus ridibundus* – Draining of part of Ainderby Bottoms meant that the small colony here was already in terminal decline by the time of the YNU visit. Older villagers remember going to collect the gull eggs as a supplement to wartime rations.

Turtle Dove *Streptopelia turtur* – There have been no village records for more than twenty years.

Cuckoo *Cuculus canorus* – Now recorded less than annually with no evidence of breeding in recent years.

Tree Pipit *Anthus trivialis* – I have never seen this in Ainderby in my twenty-five years in the village.

Redstart *Phoenicurus phoenicurus* – Breeding was recorded through to the 1960s but an autumn migrant in my garden is the only modern sighting.

Whinchat *Saxicola rubetra* – A single spring migrant is the only recent record.

Grasshopper Warbler *Locustella naevia* – There have been no modern records other than a bird heard singing for one day in spring 2014.

Sedge Warbler *Acrocephalus schoenobaenus* – Bred up to the late 1990s and seemed to be adapting to habitat loss by nesting in Oil-seed Rape fields but there have been no recent sightings.

Reed Warbler *Acrocephalus scirpaceus* – This must have been a scarce and localised bird even in 1946 and it was largely absent from the Vale of Mowbray until the early years of the current century. Its reappearance was linked to the establishment of reed beds at some of the local nature reserves. A bird briefly holding territory around a village pond in the autumn of 2014 might give hope for future breeding in the village.

Marsh Tit *Poecile palustris* – Occasional sightings up to the early 1990s but no subsequent records.

On the positive side of the balance sheet we have a few rather more meagre pickings with Greylag *Anser anser* and Canada Goose *Branta canadensis*, Collared Dove *Streptopelia decaocto* (which of course had not been recorded in Britain at the time of the excursion) and Nuthatch *Sitta europaea* added to the list of breeding birds.

However, with the continuing destruction of hedgerows, further drainage and a large solar farm planned for some of the last remaining 'unimproved' grassland, I wonder if, in 60 years' time, local birdwatchers will look back on this period with the same sense of nostalgia and loss?

Acknowledgements
Thanks to Chris Young, John Bowers and Colin Howes for locating and forwarding the material to me.

Early notes from Spurn Bird Observatory

John R. Mather

Spurn Bird Observatory first came into being in November 1945 when Ralph Chislett acquired a lease on the Warren Cottage from the Lands Department of Northern Command in York. Before this was actually signed, George Ainsworth had already erected a Heligoland trap in the cottage garden, the first of several such traps built along the peninsula during the ensuing years, establishing Spurn as one of the earliest and most important bird observatories in Britain.

Whilst sorting through the library and papers of John Cudworth, long-term member and Chairman of the Spurn Bird Observatory Committee now living in a retirement home in Wakefield, his friend David Proctor discovered an old foolscap log book entitled SPURN BIRD OBSERVATION STATION – DETAILED OBSERVATIONS. It contains discontinuous entries covering the periods 12 August to 30 December 1946, 21 and 22 April 1947 and 18 February to 8 March 1950. Why there are such long gaps in this seemingly important log book is difficult to understand as it is known from ringing results and published records that the observatory was actively manned during the missing periods. Another, perhaps the main, log book must exist for those intervening and subsequent years.

Thirty-nine observers were involved in the 1946 entries, including some familiar names of the period: G.H. Ainsworth, W.B. Alexander, H.O. Bunce, C.E.A. Burnham, R. & L. Chislett, Miss E. Crackles, R.M. Garnett, Miss E.P. Leach (BTO Ringing Secretary), J. Lord, W.H. Rowntree and C.M. Swaine. It is strange that there were entries for only two days in 1947 when S. Jackson, E. Holmes and their wives " - - - arrived at 7.30pm, cool to cold very strong SW wind, mostly sunny – no birds at all near trap". Of the nine contributors for the eleven days covered in February and March 1950, six appeared for the first time: J. Cudworth, P.E. Davies, R.F. Dickens, G.R. Edwards and I.Morley, all of whom are known to have been visiting regularly during 1948 and 1949. The entries are typical of such daily logs, outlining personnel present, weather, general activities including ringing totals and observations by those staying at the infant observatory. There are, however, two entries which are of particular interest and historical importance.

Firstly, the two opening pages of the log book written in Ralph Chislett's stylish hand, make very interesting reading and are reproduced below *in extenso:*

WHITSUNTIDE 1946
Official meeting of the Yorkshire Naturalists' Union

> The principal value to Yorkshire ornithologists of a visit to Spurn and the Humberside marshes of Welwick (where one day was spent) between June 7 and 11, lay in the opportunity to assess the breeding birds and so help towards their separation from passage migrants of late summer. Starling, Linnet, Reed Bunting, House Sparrow, Meadow Pipit, Whitethroat and Blackbird were abundant; the huts of the W/D (War Department) provided haunts for Starlings and Sparrows and the other species nesting in the low herbage, mainly Marram Grass and Sea Buckthorn; Greenfinches,

Corn Buntings, Song Thrushes and Hedge Sparrows were less numerous. Carrion Crow and Magpie, Chaffinch, Pied Wagtail, Sedge Warbler and Wren were few. Only one pair of Yellow Wagtails (feeding young near Welwick) was noted. A small colony of Reed Warblers near Skeffling had not previously been recorded.

A Swallow, sitting on four eggs, shared its O.P. (Observation Post) habitat with several naturalists during heavy rain. Martins and Swifts were noted. A female Cuckoo, attended by two males, passed the weekend in the vicinity of the ringing trap, in which one had been caught and ringed a week previously. Kestrel, Sparrowhawk, Heron and Turtle Dove were seen occasionally. Ducks on the estuary were several pairs of Shelducks (breeding locally), a pair of Tufted Ducks and a distant flock of black ducks, probably Common Scoters.

Breeding waders included a few Lapwings, whose numbers should have been greater; Ringed Plover (4 nests seen), 3 pairs of Oystercatchers, one of which at least had an egg; and Redshank vociferous over their young in several places. Many nests of the Little Tern were seen, some with only one egg and very few with three. One pair had young. This, the only colony in Yorkshire, has stood up to war conditions remarkably well; much better than it is likely to do due to the disturbances caused by parties that now picnic near to the nesting ground on fine Sundays. If the new road to the Point remains open the Terns will probably have disappeared in a very few years, since they cannot maintain themselves unless they rear sufficient chicks to repair the natural wastage, which they are not likely to do this year. Other local breeders noted were Moorhen and Common and Red-legged Partridges (nest found). The Wheatear, a one-time breeder there, was not noted.

At this date passage migrant species were few and in small numbers, but some of the waders seen would not breed locally. At high tide up to 100 Curlews lined the shore; and upward of 40 Oystercatchers, Dunlins, Golden and Grey Plovers and Sanderlings were fewer but were noted. A few Sandwich and Common (or Arctic) Terns passed. The motley gulls included all 6 species in most stages of plumage. A Kittiwake picked up dead (very recent) was in excellent feather.

Even on June 10, when Swifts should be nesting, parties flew both ways along the promontory. Whether they were passage birds or merely on foraging expeditions could not be stated. During incubation Swifts are little in evidence about their habitat for long periods and their mileage is not compass-governed! A few House Martins were also noted flying south. R.C.

Secondly, in the YNU Bird Report for 1946, Chislett published the record of a male Little Crake *Porzana pusilla*, seen by G.H. Ainsworth and J.H. Barrett on 28 December, giving brief details of the plumage and behaviour. The bird was seen in the 'Wire Dump', an area halfway along the peninsula at the Chalk Bank, consisting of heaps of rusting rolls of barbed wire discarded after the war amongst an often flooded area of Glasswort *Salicornia europaea*. He included the record, repeating the same brief details, in his *Yorkshire Birds* (Chislett, 1953) and I published it in *The Birds of Yorkshire* (Mather, 1986). The only details available until now have been those

published by Chislett and it is therefore of great interest to find the original entry in the log book written by Barrett on the day of observation:-

> "Whilst we were watching a flock of sparrows in the wire, we heard a sudden 'ZEL' note rather like a loud Siskin. On going towards the pile of wire, we flushed a bird smaller than a Water Rail. The wing-coverts were chestnut-brown with well defined dark centres to feathers. The flanks, throat, sides of neck and chest were uniform slate grey. The legs appeared to be grey. We decided to return later in the day and J. Barrett had a close view (5 yards). The bird was observed feeding in the brackish water, but on our approach skulked away with body held horizontally and head well out. The beak was greenish but orange-scarlet towards the base and was not nearly as long as that of a Water Rail. The tail was held erect and was dark in the centre and light brown at the sides. There was no barring on the flanks".

Chislett (1953) concluded by saying; "The absence of white streaking on wing coverts and of barring on the flanks point to this species and against Baillon's Crake. That two such competent observers were able to obtain such good views places the identification beyond any reasonable doubt". This was the sixth record of this bird in Yorkshire, the others being in the 19th century as follows:

One was shot on the banks of the Yore (River Ure) near Wensley on 6 May 1807 by Mr John Humphrey: it was alone and suffered itself to be approached very near without betraying any sense of danger. It ran with great rapidity, carrying its tail erect.

Thomas Allis (1844) reported, "H. Reid tells me that a specimen of this rare bird was taken alive at Cantley near Doncaster; it ran into a tuft of grass and was captured by a boy and came into Reid's possession about 18 years ago (*c.*1826)".

One was captured at Scarborough in 1836 and recorded by Professor W.C. Williamson.

One was caught alive on a canal boat on 6 May 1862 on the River Ure at Aldwarke Bridge near York and went to the collection of Mr Johnson of Masham, being later acquired by J.C. Garth of Knaresborough, in whose collection Nelson saw it. At the dispersal of Garth's effects in December 1904, the specimen was bought by Riley Fortune of Harrogate.

One was taken alive at Green Hammerton on 17 October 1892. The specimen was sent to Lord Lilford who identified it.

The Little Crake has not since been seen in Yorkshire. It breeds from Eastern Germany and Poland eastwards across Central Europe, with isolated populations in the marshes of Iberia, France and the Balkans.

References

Allis, T. (1844) *The birds of Yorkshire: being a historical account of the avi-fauna of the County*. Report of the British Association for the Advancement of Science.

Chislett, R. (1953) *Yorkshire Birds*. A Brown, London & Hull

Mather, J.R. (1986) *Birds of Yorkshire*. Christopher Helm, London

Colonization of sand and gravel quarry ponds by aquatic plants: the example of North Cave Wetlands 2001-2013

R. Goulder 5 Bishops Croft, Beverley HU17 8JY
Email: r.goulder@hull.ac.uk

There are many ponds scattered throughout lowland England that are a legacy of industrial minerals extraction and are often valuable resources for wildlife. In East Yorkshire, for example, ponds that originated through extraction of sand/gravel, clay or spoil for construction of railway embankments have greater species richness of water plants and more species of regional conservation significance than village ponds, ancient moats or ponds of miscellaneous origin (Linton & Goulder, 1997, 2000). The initial colonization by aquatic plants of new ponds formed by the flooding of pits left by minerals extraction can be rapid. For example, clay-pit ponds in Purbeck, Dorset, acquired 5-8 species of aquatic plants within 2-4 years of abandonment (Barnes, 1983). Even more striking is that at least 67 wetland and aquatic plants colonized an experimental pond complex dug in the clay and gravel of the River Thames floodplain within seven years (Williams *et al*, 2008). Rapid colonization is especially well shown by events at North Cave Wetlands, a 39ha site of former sand and gravel workings in East Yorkshire that was acquired as a reserve by the Yorkshire Wildlife Trust in 2000. The lakes on this site (Fig. 1) were primarily excavated between 1983 and 1999. By 2001 they had been colonized by more than twenty aquatic plants (Goulder, 2002). Of the submerged plants Lesser Pondweed[1], Horned Pondweed, Spiked Water-milfoil and Stonewort were widely distributed. Emergents were represented by Celery-leaved Buttercup on muddy strands around all the lakes. Common Reed, Bulrush, Brooklime and Blue Water-speedwell were scattered around some of the lakes.

Talling (1951) suggested a model to describe the colonization of new ponds. His view was: (1) new ponds are rapidly colonized and he cites a description of a new pond at Garstang, Lancashire, that became colonised by a diversity of water plants within only 20 months; (2) once ponds are established their colonization by further plants is reduced, firstly because of competitive exclusion by already established ones and secondly because once plants from the pond's environs have colonized then the pool of species that have not yet colonized is in consequence diminished. The present paper investigates continuing colonization by aquatic plants at North Cave Wetlands from 2001 to 2013 and evaluates Talling's model in that context.

Site description and methods

The history and physical features of the reserve are described by Martin (2011) and an account of terrestrial and aquatic plants and vegetation is given by Boatman & Goulder (2011). The approximate dates when excavation of the lakes (Fig. 1) was completed are: Far Lake 1983; Carp Lake 1987; Main Lake 1990; Village Lake (West) 1994; Village Lake (East) and Island Lake 1995-96, except that Island Lake was extended eastwards with construction of islands between 2001 and 2004; and Reed Bed Lake 1999. In 2001 what later became Reed Bed Lake comprised a several-metres deep quarry with shallow pools at the bottom; this was later back-filled and by 2004 had been flooded and extensively planted with Common Reed.

---

[1] Scientific names which are included in Table 1 (page 193) are not repeated in the text.

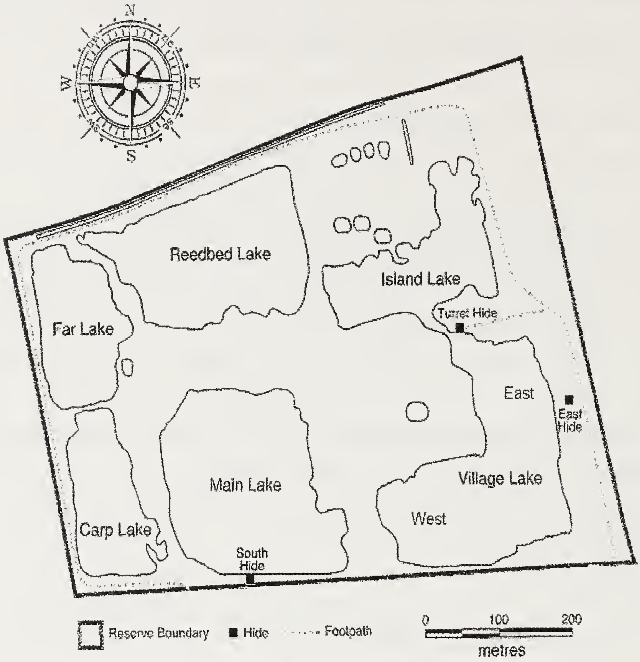


Figure 1. Map of North Cave Wetlands

Far Lake and Carp Lake retain their original profiles and are several metres deep, while shallow areas of Village Lake were conserved and areas of Main Lake and Island lake were partially in-filled between 2001 and 2004 to create shallow (<1m deep) water for the benefit of waterfowl. Thus, for example, counts of over 1500 Greylag Goose *Anser anser* have been recorded on the reserve (Dayes & Griffiths, 2011). By 2013 the margins of Far Lake and Carp Lake and the west side of Main Lake had become extensively tree clad. There is intermittent inflow of spring water at the eastern edge of the reserve and Martin (2011) describes how the lakes are interconnected with gravity-driven water flow from east to west; water from Village Lake can be directed through Main Lake, Carp Lake and Far Lake to discharge into Black Dyke at the north-west corner of the reserve, while water from Island Lake can be directed through Reed Bed Lake also to discharge into Black Dyke. In July 2001 pH and conductivity in the lakes were within the relatively narrow ranges of 6.6-6.8 and 929-1002µS cm^{-1} respectively (Goulder, *loc. cit.*), indicating that the lakes had broadly similar water quality.

Water plants in the lakes and their margins were recorded during June and July in 2001, 2004, 2007, 2010 and 2013. This was done by walking around the circumference of the lakes to record emergent plants growing in shallow water and on littoral mud; submerged plants were retrieved using a grapnel. In 2001 the eastern part of Village Lake and the then un-extended Island Lake were recorded together. From 2004 onwards Village Lake (East), Village Lake (West) and Island lake were recorded as separate lakes. The approximate abundance of each species in each lake was recorded using a truncated three-point DAFOR scale; that is d/a = dominant or abundant, f = frequent, o/r = occasional or rare. Only those that feature on the Palmer & Newbold (1983)

checklist of aquatic plants in England and Wales were recorded, plus Stonewort. Species of batrachian water crowfoot were identified only when flowers were present, except for the distinctive Fan-leaved Water-crowfoot, using Rich & Jermy (1998) and it is acknowledged that, even with flowering material, identifications can be problematical (Lansdown, 2008). Blue Water-speedwell and Pink Water-speedwell were not separated in 2010 and 2013 because of difficulty with identification of seedlings.

Aquatic plants in the lakes

The aquatic plants recorded in the lakes are shown in Table 1, p193; the complete set of results with those found in each lake on each recording occasion and their abundance is available as additional electronic material (Appendix 1 - please see http://www.ynu.org.uk/node/493). The numbers of species per lake were very variable, ranging from eight in Far Lake in 2001 to 24 in Village Lake (West) in 2010. The range for submerged and floating-leaved plants was from two in Island Lake in 2013 to ten in Village Lake (East) in 2010; that for emergent plants was from two in Far Lake in 2007 to 17 in Village Lake (West) in 2010. There was not a steady increase in each lake over the study period, nor did the lakes share a common pattern of change. Thus, for example, the number in Far Lake increased from eight in 2001 to 16 in 2004 but fell back to nine in 2010 and 2013; in Carp Lake the number increased from nine in 2001 to 12 in 2007 and remained at that number in 2013; in Village Lake (West) the number of species increased from ten in 2001 to 24 in 2010 but then fell to 16 in 2013 (Appendix 1). It is also clear that there was not a steady increase in the numbers in the lakes as a whole (Table 2, p195). Instead the total number increased from 22 in 2001 to 27 in 2004 and to 33 in 2007 but then remained at that number in 2010 and 2013. Similarly, the number of submerged and floating-leaved plants increased from nine to 12 between 2001 and 2007 but then stabilized at 12-14 between 2007 and 2013, while emergents increased from 13 to 21 between 2001 and 2007 but stabilized at 19-21 between 2007 and 2013 (Table 2).

There were both similarities and differences between lakes (Table 1). Some species were, at one time or another, found in most of the lakes; examples of these amongst submerged plants were Stonewort, Spiked Water-milfoil, Curled Pondweed, Fennel Pondweed, Lesser Pondweed and Horned Pondweed. More-or-less ubiquitous emergent and marginal plants included Soft-rush, Celery-leaved Buttercup, Common Reed, Bulrush and Brooklime. Others, in contrast, were recorded in only three or fewer lakes: the submerged plants, Rigid Hornwort, Nuttall's Waterweed and Fan-leaved Water-crowfoot and emergent plants, Water-plantain, Sea Club-rush, Water Forget-me-not and Common Club-rush.

Between 2001 and 2013 there were substantial changes in both the plants present and their abundance within individual lakes. This is clearly shown by consideration of the plants that were sometime recorded as dominant or abundant (Tables 3 & 4, p195-7). Several themes emerge from consideration of the results for submerged and floating-leaved plants (Table 3).

- Some that had already colonized the reserve by 2001 became dominant or abundant in several of the lakes and persisted as such for several years, for example: Spiked Water-milfoil in Far Lake, Carp Lake and Main Lake from 2001 to 2007 and in Village Lake (East & West) from 2004 to 2013; Lesser Pondweed in Far Lake, Carp Lake and Reed Bed Lake from 2001 to 2007, in Main Lake from 2004 to 2010, in Village Lake (West) from 2001 to 2010 and Village Lake (East) from 2004 to 2013.

- Some of the early colonizers were sometimes dominant or abundant for shorter periods, for example Curled Pondweed in Main Lake and Horned Pondweed in Village Lake (West) only in 2001.
- Some later arrivals on the reserve became dominant in some of the lakes, for example Nuttall's Waterweed, first recorded in 2007 in Far Lake, was dominant or abundant in that lake from 2007 to 2013 and in Carp Lake in 2013; Rigid Hornwort, first recorded in 2004 in Far Lake, was dominant/abundant in Village Lake (East) in 2013; Fan-leaved Water-crowfoot, first recorded in Village Lake (West) in 2010 was dominant/abundant in Main Lake in 2013.
- In some lakes there was an obvious succession of dominant/abundant plants with some replacing others, for example in Far Lake, Spiked Water-milfoil and Lesser Pondweed were both dominant/abundant in 2001 and 2004 and were joined in 2007 by Stonewort, Nuttall's Waterweed, Curled Pondweed and Fennel Pondweed but Nuttall's Waterweed had emerged as the only dominant by 2010 and continuing to 2013. A general trend shown by this succession was the replacement of Spiked Water-milfoil and Lesser Pondweed as dominant/abundant plants by Nuttall's Waterweed, Rigid Hornwort and Fan-leaved Water-crowfoot. Thus, in 2001 and/or 2004 Spiked Water-milfoil was dominant or abundant in six lakes and Lesser Pondweed in all seven lakes while by 2010 and/or 2013 they were dominant/abundant in only two and three lakes respectively. In contrast, Nuttall's Waterweed had become dominant in Far Lake and Carp Lake while Rigid Hornwort was dominant/abundant in Village Lake (East) and Fan-leaved Water-crowfoot in Main Lake by 2013.

The behaviour of emergent plants on the Reserve, as exemplified by those that were at some time recorded as dominant or abundant (Table 4), was somewhat different from that of the submerged plants; essentially more emergents were recorded as dominant or abundant as time progressed. In 2001 there were virtually none that were sufficiently luxuriant to be recorded as dominant or abundant (the exception being Celery-leaved Buttercup in muddy places on the bottom of the not-yet-flooded Reed Bed Lake). In 2004 Celery-leaved Buttercup was dominant/abundant around Main Lake, Island lake and Reed Bed Lake, Soft-rush was dominant/abundant along the south side of Village Lake (West), where it had been introduced in staked-down coir rolls used for bank stabilization work in 2002, and Common Reed was abundant in Reed Bed Lake, in which it had been planted. By 2007-2013, however, more emergents had colonized and spread to the extent that they were recorded as dominant or abundant. These included Bulrush in Carp Lake, Village Lake (East & West) and Island Lake, Common Reed in all but Carp Lake and Lesser Pond-sedge (originally introduced in coir rolls) in Village Lake (West). Some herbs that are characteristic of muddy littoral areas were recorded as dominant/abundant in 2007 but became less conspicuous in later years (e.g. Brookweed around Main Lake and Water-plantain and Brooklime around Reed Bed Lake).

Wetland plants not dealt with above because they are, perhaps arbitrarily, not included on the Palmer & Newbold checklist (*loc. cit.*) were also conspicuous in places around the margins of the lakes. These included Great Willowherb *Epilobium hirsutum,* Field Horsetail *Equisetum arvense*, Gypsywort *Lycopus europaeus*, Purple-loosestrife *Lythrum salicaria* and Water Figwort *Scrophularia auriculata*. The diversity of rushes was interesting. In addition to Soft-rush, which does feature on the checklist, Hard Rush *Juncus inflexus* was found at the margins of all the lakes

while Jointed Rush *Juncus articulatus*, Toad Rush *Juncus bufonius* and Compact Rush *Juncus conglomeratus* were frequently observed. There was also a single clump of Sharp-flowered Rush *Juncus acutiflorus* at the margin of Island Lake in 2010 and 2013. Scattered on the reserve are diverse scrapes, pools, dykes and ditches (Fig.1); these are widely colonized by aquatic plants but the only ones not found in the lakes were some plants in the Dragonfly Ponds (in the north-east corner of the reserve) that were obvious introductions (Middleton, 2009; Boatman & Goulder, *loc. cit.*). Photographs of some of the plants encountered can be found in Plate V, centre pages.

Discussion

The initial increase in the number of aquatic plants recorded in the lakes as a whole, from 22 to 33 species between 2001 and 2007 to a plateau after 2007 (Table 2), agreed closely with Talling's model (*loc. cit.*). The colonization process had clearly begun well before the present study commenced in 2001; by that year 22 plants (Table 1) had become established in the lakes since their excavation in 1983-1999. Lakes can be regarded as islands in a terrestrial sea (Keddy, 1976). Distribution mechanisms by which water plants can reach them include transport of seeds and/or vegetative fragments by wind and in the guts or on feet, feathers and fur of birds and mammals (Barrat-Segretain, 1996; Figuerola & Green, 2002). It is likely that some of the plants that established in the lakes had their origin in long-distance transport by waterfowl. The early-colonizing submerged species, often dominant/abundant in the lakes in 2001 (Stonewort, Spiked Water-milfoil, Lesser Pondweed and Horned Pondweed), are all typical early colonizers of gravel pits and are eaten and dispersed by waterfowl (Moore, 1986; Preston & Croft, 1997). Dispersal may also be over short distances, perhaps less than 1km or so. Indeed, study of plants in ponds and their neighbouring water bodies has suggested that such short-distance dispersal is important in the colonization of ponds in East Yorkshire (Linton & Goulder, 2003). Many of the water plants that colonized the lakes before 2001 are also found at other water and wetland sites in the neighbourhood; 16 of the 22 checklist species recorded in the lakes in 2001 were also found in ponds, streams, dykes and wet pasture within 1km of the Reserve boundary (Goulder, *loc. cit.*). Colonization by short-distance dispersal from nearby water bodies is, therefore, likely to have been important. This process seems to have continued in that seven further plants found within 1km of the reserve in 2001 were recorded as new to the lakes between 2001 and 2007 (Common Duckweed, Water-plantain, Lesser Pond-sedge, Yellow Iris , Water Forget-me-not, Reed Canary-grass and Pink Water-speedwell). Some of these, however, were also direct introductions, at least to Village Lake (West) where they were in the coir rolls used for bank stabilization, notably Lesser Pond-sedge, Yellow Iris, Water Forget-me-not and Reed Canary-grass. After 2007 colonization from the neighbourhood appeared to have largely ceased; only one plant found within 1km of the site in 2001 (Fan-leaved Water-crowfoot) was recorded as new to the lakes between 2007 and 2013. Only seven out of 31 checklist taxa recorded within 1km of the Reserve boundary in 2001 (Goulder, *loc. cit.*) had failed to reach the lakes by 2013. This evidence agrees with Talling's (*loc. cit.*) model in that depletion of the pool of plants that had not yet reached the lakes was probably a reason why the initially rapid colonization largely ceased after 2007. Also in alignment with island biogeography theory applied to lakes (Keddy, *loc. cit.*) is that once stability had been reached a few new ones continued to appear, balanced by the apparent loss of others. Thus between 2007 and 2013 the total number was constant while Small Pondweed and Fan-leaved Water-crowfoot were new records but Fool's Water-cress and Marsh Horsetail were apparent losses.

Some of the plants that were at some time or other recorded in all or most of the lakes (Table 1) were perhaps readily spread from lake to lake by waterfowl; examples of these are Lesser Pondweed and Horned Pondweed. Others, more or less ubiquitous, are likely to have been spread around the reserve by wind dispersal; Common Reed and Bulrush, for example, are spread by wind (Barrat-Segretain, *loc. cit.*). Some that were found in more than one lake may have been carried by the flow of water around the reserve. Thus Fan-leaved Water-crowfoot, first recorded in Main Lake in 2013, may have originated from Village Lake (West) in which it was recorded in 2010. Others, in contrast, were recorded in only one lake; for example Water Forget-me-not in Village Lake (West), Water-plantain in Reed Bed Lake and Sea Club-rush in Island Lake (Table 1). Perhaps few propagules of these plants with limited distribution reached the lakes. Furthermore, some are known introductions while others may be inadvertent introductions; Water-plantain, for example, may have piggy-backed on the Reeds planted in Reed Bed Lake.

In addition to an element of chance governing which plants reached which lakes, there may be between-lake differences in local environment that favoured or constrained particular plants. The shallower lakes are more used by waterfowl and it is well known that their grazing can reduce submerged-plant biomass (e.g. Lauridsen *et al*, 1993; Søndergaard *et al*, 1996; Wood *et al*, 2012). Thus greater grazing pressure probably contributed to Reed Bed Lake and Island Lake becoming largely devoid of submerged plants. Furthermore, the marginal vegetation was grazed down to a short grassy sward in places, for example along the south side of Island Lake. In contrast, there is less potential habitat for emergent plants along the margins of the deeper lakes, for example Far Lake and Carp Lake, because the edges fall steeply to deep water and there is also shading by trees. Differences in species composition between neighbouring gravel-pit ponds elsewhere in East Yorkshire have been related to water quality. The occurrence and dominance of Rigid Hornwort in only one of several ponds along the Brandesburton Gravel Ridge was related to high nitrate-nitrogen concentration, but this was explained by input from a field drain from arable land (Goulder & Boatman, 1971). Fertilization of specific lakes by such point-source inputs has not been identified at North Cave, although enrichment of the shallower lakes by guano is possible and this may have led to observed extensive growth of filamentous green algae (Chlorophyceae). Surface colonization of submerged plants by algae can lead to repression of their growth (Phillips *et al*, 1978).

Whether competition from established species hindered colonization by new ones as suggested by Talling (*loc. cit.*) is not clear but the question of whether there is interspecific competition between established plants can be addressed by consideration of within-lake change in dominance/abundance during the 2001-2013 period of study. Perhaps the best example of interspecific competition amongst submerged plants was provided by Nuttall's Waterweed in Far Lake and Carp Lake (Table 3). This North American plant is an aggressive colonizer that was first recorded in Britain in 1966 (Preston & Croft, *loc. cit.*). It was first recorded in Far Lake in 2007 and in Carp Lake in 2010; by 2013 it formed dense submerged masses in both lakes while submerged plants that had previously been dominant or abundant in these lakes were apparently out-competed. These observations are in agreement with those of Williams *et al, (loc. cit.*) who found that the primary colonizers of newly-dug experimental ponds (Blunt-leaved Pondweed *Potamogeton obtusifolius* and Perfoliate Pondweed *Potamogeton perfoliatus),* disappeared when the aliens Nuttall's Waterweed and Curly Waterweed *Lagarosiphon major* invaded.

Some decreases of submerged plants previously dominant/abundant could not, however, be linked to competition (Table 3). For example, Stonewort, Spiked Water-milfoil and Lesser Pondweed were all dominant/abundant in Island Lake in 2004 but none of them were recorded in 2013. Similarly, Stonewort, Lesser Pondweed and Horned Pondweed were dominant /abundant in Reed Bed Lake in 2007 but by 2013 Stonewort was not recorded, Lesser Pondweed was occasional/rare and Horned Pondweed was recorded only as frequent. In neither of these lakes were these decreases paralleled by increases in potential competitors. Perhaps substantial grazing by waterfowl and excessive guano-fertilized growth of filamentous green algae led to the sparseness of submerged plants in these lakes.

The pattern of change amongst sometime dominant/abundant emergent plants (Table 4) was generally different from that shown by submerged ones. There had been little colonization by emergent plants by 2001 (Appendix 1). None was recorded as dominant or abundant (Table 4) with the exception of Celery-leaved Buttercup in the later-backfilled quarry that became Reed Bed Lake. Colonization and within-lake extensions of range then proceeded so that from 2004 to 2013 several emergents were able to spread from 2004 to 2013 because vacant littoral space was available. Thus, for example, Common Reed and Bulrush became dominant or abundant in many of the lakes. There were, however, some deviations from the pattern of continuous extension of cover by emergent plants that had reached lakes by natural dispersal; these reflected introductions and possibly inter-specific competition. The most obvious introduction is that of Common Reed to Reed Bed Lake. Also notable, however, are the emergent species that were introduced to Village Lake (West) in 2002 in coir rolls. By 2004 Soft-rush was dominant along the south margin of the lake and other introduced species included Lesser Pond Sedge and Reed Canary-grass. By 2007 the introductions were recorded as dominant/abundant but subsequently Soft-rush and Reed Canary-grass became less important, possibly outcompeted by vigorous growth of Common Reed. There also appears to have been competitive exclusion of emergents by Common Reed in Reed Bed Lake. The littoral community there had developed to include a range of dominant/abundant plants by 2007: Water-plantain, Common Spike-rush, Bulrush, Blue/Pink Water-speedwell and Brooklime, but by 2010 only Common Reed was recorded as dominant/abundant. Other conspicuous changes in the cover of emergent plants are less explicable; for example, a band of Brookweed, up to 3m wide and flowering profusely, was observed along the north shore of Main Lake in 2007. At the time this population looked as if it was about to be engulfed by encroaching willow scrub; it was never again recorded as dominant/abundant in any of the lakes.

Colonization of the North Cave lakes by water plants followed the model set forth by Talling (*loc. cit.*). After an initial rapid increase, the number of species in the lakes as a whole became stable with losses balancing further gains. It is likely that many of the colonizers came from local sources although long-distance transport by waterfowl was perhaps also important. The achievement of a steady state was perhaps more due to reduction in the pool of available colonizers than to competitive exclusion, although there was evidence of some within-lake competition and exclusion. The size of the reserve is in the process of incremental increase from its original 39ha to a proposed 138ha as further mineral workings are incorporated (Martin, *loc. cit.*). It will be interesting to see if the extended wetland area and greater habitat diversity leads to a further influx of aquatic plants. No nationally or regionally rare or scarce aquatic plants (Middleton & Cook, 2013) were found in the lakes but the site is nevertheless of botanical

interest and, furthermore, the water plants are a valuable food resource for the waterfowl that use the reserve. The North Cave lakes may be put into a wider context by comparison with an 81ha site at Farnham on the northern edge of Knaresborough which is also a nature reserve with emphasis on waterfowl (Atkinson & Mather, 1994) and which has lakes occupying 34ha from which gravel was extracted between c.1941 and 1980 (Evison, 1994). Thirty-five aquatic plants, i.e. Palmer & Newbold (*loc. cit.*) checklist species, have been recorded in the south lake at Farnham (area 10ha, excavated in the 1950s and early 1960s); that is 13 submerged and floating-leaved ones and 22 emergents (Mellard & Mettam, 1994; unpublished species lists up to 2008 supplied by J. E. Atkinson; the author's records in August 2014). This compares with c.40 species overall recorded in the North Cave lakes between 2001 and 2013. There was some affinity between the two sites in that 22 plants were recorded both in Farnham south lake and in the North Cave lakes.

Acknowledgements

I am grateful to Stephen Martin for encouragement, for reading a draft of the manuscript and for permission to reproduce the map of the reserve. I also thank June Atkinson for plant lists and information about the gravel pits at Farnham.

References

Atkinson, J.E. & Mather, J.R. (eds.) (1994) *The Natural History of Farnham Gravel Pit*. Harrogate and District Naturalists' Society, Harrogate.

Barnes, L.E. (1983) The colonization of ball-clay ponds by macroinvertebrates and macrophytes. *Freshwater Biology*, 13: 561-578.

Barrat-Segretain, M.H. (1996) Strategies of reproduction, dispersion, and competition in river plants: a review. *Vegetatio*, 123: 13-37.

Boatman, D.J. & Goulder, R. (2011) Plants and vegetation: change over the first ten years. In *North Cave Wetlands: the First Ten Years*, ed. Ashforth, M. & Dayes, G., 82-91. North Cave Wetlands Local Management Group, North Cave.

Dayes, G. & Griffiths, S. (2011) Systematic list of birds. In *North Cave Wetlands: the First Ten Years*, ed. Ashforth, M. & Dayes, G., 12-51. North Cave Wetlands Local Management Group, North Cave.

Evison, R. (1994) Geology and history of the site. In *The Natural History of Farnham Gravel Pit*, ed. Atkinson, J.E. & Mather, J.R. 1-3. Harrogate and District Naturalists' Society, Harrogate.

Figuerola, J. & Green, A.J. (2002) Dispersal of aquatic organisms by waterbirds: a review of past research and priorities for future studies. *Freshwater Biology*, 47: 483-494.

Goulder, R. (2002) Aquatic plants at North Cave Wetlands, a new Yorkshire Wildlife Trust reserve comprising former gravel workings. *The Naturalist*, 127: 57-64.

Goulder, R. & Boatman, D.J. (1971) Evidence that nitrogen supply influences the distribution of a freshwater macrophyte, *Ceratophyllum demersum*. *Journal of Ecology*, 59: 783-791

Keddy, P.A. (1976) Lakes as islands: the distributional ecology of two aquatic plants, *Lemna minor* L. and *L. trisulca* L. *Ecology*, 57: 353-359.

Lansdown, R.V. (2008) *A Field Guide to the Riverine Plants of Britain and Northern Ireland.* Ardeola Environmental Services, Stroud.

Lauridsen, T.L., Jeppesen, E. & Andersen, F.Ø. (1993) Colonization of submerged macrophytes in shallow fish manipulated Lake Væng: impact of sediment composition and waterfowl grazing. *Aquatic Botany*, 46: 1-15.

Linton, S. & Goulder, R. (1997) Botanical conservation value of East Yorkshire ponds: a comparison of village ponds and clay-pit ponds. In *British Pond Landscapes, Action for Protection and Enhancement*, ed. Boothby, J., 165-171. Pond Life Project, Liverpool and Pond Action, Oxford.

Linton, S. & Goulder, R. (2000) Botanical conservation value related to origin and management of ponds. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 10: 77-91.

Linton, S. & Goulder, R. (2003) Species richness of aquatic macrophytes in ponds related to number of species in neighbouring water bodies. *Archiv für Hydrobiologie*, 157: 555-565.

Martin, S. (2011) A brief history of the reserve. In *North Cave Wetlands: the First Ten Years*, ed. Ashforth, M. & Dayes, G., 6-11. North Cave Wetlands Local Management Group, North Cave.

Mellard, T. & Mettam, A. (1994) Botany. In *The Natural History of Farnham Gravel Pit*, ed. Atkinson, J.E. & Mather, J.R. 7-14. Harrogate and District Naturalists' Society, Harrogate.

Middleton, R. (2009) Yorkshire Naturalists' Union excursions in 2008, North Cave Wetlands (VC61) 26 July 2008, Botany. *The Naturalist*, 134:162.

Middleton, R. & Cook, P.J. (2013) *South-east Yorkshire (vc61) Rare Plant Register*. BSBI, London, available from: http://bsbi.org.uk/SEYorksRPR2013.pdf.

Moore, J.A. (1986) *Charophytes of Great Britain and Ireland*. BSBI, London.

Palmer, M. & Newbold, C. (1983) *Focus on Nature Conservation No. 1, Wetland and Riparian Plants in Great Britain*. Nature Conservancy Council, Shrewsbury.

Phillips, G.L., Eminson, D. & Moss, B. (1978) A mechanism to account for macrophyte decline in progressively eutrophicated freshwaters. *Aquatic Botany*, 4: 103-126.

Preston, C.D. & Croft, J.M. (1997) *Aquatic Plants in Britain and Ireland*. Harley Books, Colchester.

Rich, T.C.G. & Jermy, A.C. (1998) *Plant Crib 1998*. BSBI, London.

Søndergaard, M., Bruun, L., Lauridsen, T., Jeppesen, E. & Madsen, T.V. (1996) The impact of grazing waterfowl on submerged macrophytes: in situ experiments in a shallow eutrophic lake. *Aquatic Botany*, 53: 73-84.

Talling, J.F. (1951) The element of chance in pond populations. *The Naturalist*, 76: 157-170.

Williams, P., Whitfield, M. & Biggs, J. (2008) How can we make new ponds biodiverse? A case study monitored over 7 years. *Hydrobiologia*, 597: 137-148.

Wood, K.A., Stillman, R.A., Clarke, R.T., Daunt, F. & O'Hare, M.T. (2012) The impact of waterfowl herbivory on plant standing crop: a meta-analysis. *Hydrobiologia*, 686: 157-167.

Table 1. Aquatic plants recorded in the lakes at North Cave Wetlands, 2001-2013

	Lakes in which the species was recorded
Submerged and floating-leaved plants	
Callitriche sp. water-starwort*	R
Ceratophyllum demersum Rigid Hornwort	(F) (C) Ve
Chara vulgaris agg. Stonewort*	(F) (C) M (Vw) (Ve) (I) (R)
Elodea nuttallii Nuttall's Waterweed	F C
Lemna minor Common Duckweed	(F) Ve I R
Myriophyllum spicatum Spiked Water-milfoil*	(F) C (M) Vw Ve (I)
Persicaria amphibia Amphibious Bistort	(F) M Vw Ve I (R)
Potamogeton berchtoldii Small Pondweed	(F) (M)
Potamogeton crispus Curled Pondweed*	F (C) (M) (Vw) Ve (I)

Potamogeton pectinatus Fennel Pondweed*	F C M Vw Ve
Potamogeton pusillus Lesser Pondweed*	F C M Vw Ve (I) R
Ranunculus aquatilis Common Water-crowfoot*	(C) (M) (R)
Ranunculus baudotii Brackish water-crowfoot	C (M) (Ve)
Ranunculus circinatus Fan-leaved Water-crowfoot	M Vw Ve
Ranunculus peltatus Pond Water-crowfoot*	(R)
Ranunculus trichophyllus Thread-leaved Water-crowfoot	(F) (C)
Ranunculus spp. (subg. *Batrachium*) water-crowfoot	F (C) (Ve)
Zannichellia palustris Horned Pondweed*	(F) (C) (M) (Vw) Ve (I) R
Emergent plants	
Agrostis stolonifera Creeping Bent*	F C M Vw Ve I R
Alisma plantago-aquatica Water-plantain	R
Apium nodiflorum Fool's Water-cress*	(F) (Vw) (Ve)
Bolboschoenus maritimus Sea Club-rush	I
Carex acutiformis Lesser Pond-sedge	Vw
Eleocharis palustris Common Spike-rush*	C M Vw Ve I R
Equisetum fluviatile Water Horsetail*	(R)
Equisetum palustre Marsh Horsetail	(Vw)
Iris pseudacorus Yellow Iris	C Vw Ve (R)
Juncus effusus Soft-rush*	F C M Vw Ve I R
Mentha aquatica Water Mint*	(F) M Ve I (R)
Myosotis laxa Tufted Forget-me-not	M (Vw) Ve I
Myosotis scorpioides Water Forget-me-not	Vw
Nasturtium officinale agg. Water-cress*	(F) M (Vw) Ve I (R)
Phalaris arundinacea Reed Canary-grass	Vw (I)
Phragmites australis Common Reed*	F M Vw Ve I R
Ranunculus sceleratus Celery-leaved Buttercup*	(F) (C) M Vw Ve I R
Samolus valerandi Brookweed*	(M) (Vw) (Ve) I (R)
Schoenoplectus lacustris Common Club-rush	(Vw) (Ve) R
Typha latifolia Bulrush*	C M Vw Ve I (R)
Veronica beccabunga Brooklime*	(F) C M (Vw) Ve I R
Veronica catenata/anagallis-aquatica Pink/Blue Water-speedwell*	F C M Vw Ve I R

Only taxa on the Palmer and Newbold (1983) checklist of aquatic plants found in England and Wales plus Stonewort *Chara vulgaris* agg. are included. Recording was done in 2001, 2004, 2007, 2010 and 2013;

Records are for F=Far Lake, C=Carp Lake, M=Main Lake, Vw=Village Lake (West), Ve=Village Lake (East), I=Island Lake and R=Reed Bed Lake.

Brackets indicate those no longer recorded in 2013; *indicates those present on the reserve at the beginning of the recording period (2001).

Table 2. The number of aquatic plant species recorded in the lakes as a whole, 2001-2013

	Submerged and Floating-leaved plants	Emergent plants	All aquatic plants
2001	9	13	22
2004	9	18	27
2007	12	21	33
2010	13	20	33
2013	14	19	33

Only taxa on the Palmer & Newbold (1983) checklist of aquatic plants found in England and Wales plus Stonewort *Chara vulgaris* agg. are included.

Table 3. Submerged and floating-leaved plants at some time recorded as dominant or abundant in lakes between 2001 and 2013

	2001	**2004**	**2007**	**2010**	**2013**
Far Lake					
Chara vulgaris agg. Stonewort	d/a	0	d/a	0	0
Elodea nuttallii Nuttall's waterweed	0	0	d/a	d/a	d/a
Myriophyllum spicatum Spiked Water-milfoil	d/a	d/a	d/a	f	0
Potamogeton crispus Curled Pondweed	0	o/r	d/a	0	o/r
Potamogeton pectinatus Fennel Pondweed	0	f	d/a	o/r	o/r
Potamogeton pusillus Lesser Pondweed	d/a	d/a	d/a	0	o/r
Carp Lake					
Chara vulgaris agg. Stonewort	0	0	d/a	d/a	0
Elodea nuttallii Nuttall's waterweed	0	0	0	o/r	d/a
Myriophyllum spicatum Spiked Water-milfoil	d/a	d/a	d/a	0	o/r
Potamogeton pectinatus Fennel Pondweed	f	d/a	d/a	d/a	o/r
Potamogeton pusillus Lesser Pondweed	d/a	d/a	d/a	o/r	o/r
Main Lake					
Chara vulgaris agg. Stonewort	d/a	d/a	d/a	o/r	o/r
Myriophyllum spicatum Spiked Water-milfoil	d/a	d/a	d/a	f	0
Potamogeton crispus Curled Pondweed	d/a	o/r	f	0	0
Potamogeton pectinatus Fennel Pondweed	f	f	d/a	f	f
Potamogeton pusillus Lesser Pondweed	f	d/a	d/a	d/a	o/r
Ranunculus circinatus Fan-leaved Water-crowfoot	0	0	0	0	d/a
Zannichellia palustris Horned Pondweed	o/r	d/a	f	0	0
Village Lake (West)					
Chara vulgaris agg. Stonewort	d/a	d/a	f	o/r	0
Myriophyllum spicatum Spiked Water-milfoil	0	d/a	d/a	d/a	d/a
Potamogeton pusillus Lesser Pondweed	d/a	d/a	d/a	d/a	o/r
Zannichellia palustris Horned Pondweed	d/a	o/r	o/r	0	0
Village Lake (East)					
Chara vulgaris agg. Stonewort	-	d/a	d/a	d/a	0
Ceratophyllum demersum Rigid Hornwort	-	0	0	0	d/a
Myriophyllum spicatum Spiked Water-milfoil	-	d/a	d/a	d/a	d/a
Potamogeton crispus Curled Pondweed	-	o/r	d/a	o/r	o/r
Potamogeton pusillus Lesser Pondweed	-	d/a	d/a	d/a	d/a

Island Lake					
Chara vulgaris agg. Stonewort	-	d/a	f	0	0
Myriophyllum spicatum Spiked Water-milfoil	-	d/a	o/r	0	0
Potamogeton pusillus Lesser Pondweed	-	d/a	d/a	o/r	0
Reed Bed Lake					
Chara vulgaris agg. Stonewort	0	o/r	d/a	0	0
Potamogeton pusillus Lesser Pondweed	d/a	d/a	d/a	f	o/r
Zannichellia palustris Horned Pondweed	o/r	0	d/a	f	f

Shading indicates dominant or abundant (d/a); f=frequent, o/r=occasional/rare, 0=not recorded, (-) indicates that separate records were not made for that lake.

Table 4. Emergent aquatic plants at some time recorded as dominant or abundant in lakes between 2001 and 2013

	2001	2004	2007	2010	2013
Far Lake					
Phragmites australis Common Reed	0	f	d/a	f	f
Carp Lake					
Typha latifolia Bulrush	f	f	f	d/a	d/a
Main Lake					
Phragmites australis Common Reed	o/r	f	d/a	d/a	d/a
Ranunculus sceleratus Celery-leaved Buttercup	o/r	d/a	o/r	f	o/r
Samolus valerandi Brookweed	0	0	d/a	o/r	0
Village Lake (West)					
Carex acutiformis Lesser Pond-sedge	0	o/r	d/a	d/a	d/a
Juncus effusus Soft-rush	o/r	d/a	d/a	f	f
Phalaris arundinacea Reed Canary-grass	0	o/r	d/a	f	o/r
Phragmites australis Common Reed	0	f	d/a	d/a	d/a
Typha latifolia Bulrush	o/r	f	d/a	d/a	d/a
Village Lake (East)					
Phragmites australis Common Reed	-	f	d/a	d/a	d/a
Typha latifolia Bulrush	-	f	d/a	d/a	d/a
Island Lake					
Bolboschoenus maritimus	-	0	f	d/a	o/r
Eleocharis palustris Common Spike-rush	-	0	f	d/a	d/a
Phragmites australis Common Reed	-	0	d/a	d/a	d/a
Ranunculus sceleratus Celery-leaved Buttercup	-	d/a	f	f	f
Typha latifolia Bulrush	-	o/r	d/a	d/a	d/a
Veronica anagallis-aquatica/catenata Blue/Pink Water-speedwell	-	f	f	f	d/a
Reed Bed Lake					
Alisma plantago-aquatica Water-plantain	0	0	d/a	f	o/r
Eleocharis palustris Common Spike-rush	f	0	d/a	f	f
Phragmites australis Common Reed	o/r	d/a	d/a	d/a	d/a
Ranunculus sceleratus Celery-leaved Buttercup	d/a	d/a	f	o/r	f

Typha latifolia Bulrush	o/r	0	d/a	o/r	0
Veronica anagallis-aquatica/catenata Blue/Pink Water-speedwell	f	o/r	d/a	f	f
Veronica beccabunga Brooklime	f	f	d/a	f	o/r

Shading indicates dominant or abundant (d/a); f=frequent, o/r=occasional/rare, 0=not recorded, (-) indicates that separate records were not made for that lake. Creeping Bent *Agrostis stolonifera* is omitted because it tended to be more terrestrial than aquatic.

Appendix 1 is available at http://www.ynu.org.uk/node/493

Establishment of Meadow Foxtail-Great Burnet meadows (MG4) on former pasture land at South Grange Farm, in the East Riding of Yorkshire

Neil Humphries[1], Jeff Lunn[2] and Paul Benyon[3]
[1]Blakemere Consultants, 1 Lower Blakemere Road, Dorchester DT1 3RZ;
[2]Trustee,The Light Owler Trust. Email: Jeff.lunn@hotmail.com;
[3]25 Highfield Road, Dunkirk, Nottingham NG7 5JE
Please direct correspondence to Jeff Lunn

Introduction

Meadow Foxtail–Great Burnet (*Alopecurus pratensis-Sanguisorba officinalis*) meadows (National Vegetation Classification (NVC) grassland type MG4, Rodwell, 1992) are very restricted in their current distribution and consequently are part of the British conservation programme as a priority Biodiversity Action Plan habitat type. Their present distribution is associated with alluvial flood meadows on free-draining, circum-neutral, alluvial loam soils where there is a high water table or surface flooding in autumn/winter (Jefferson & Pinches, 2009). This grassland type is sustained by low-intensity management of hay cutting and aftermath grazing. However, the MG4 grassland community is susceptible to damage by agricultural improvement (particularly drainage and fertilisation but also through prolonged waterlogging caused by neglect of surface drainage or through the raising of water levels (Gowing *et al.*, 2002; Benyon, 2003; Jefferson & Pinches, 2009). It is certain that the distribution of the grassland was much more extensive prior to the 19th century and earlier before the intensification of agriculture and drainage programmes of the 20th century. So little is left now that conservation partnerships and programmes have been formed to promote the restoration of the grassland type on agricultural land in the floodplains (Flood Meadows Partnership, 2014a & 2014b).

Whilst the focus of conservation effort in the UK for MG4 grassland has been on the protection and management of many of the remaining sites through the designation of Sites of Special Scientific Interest (SSSI) and stewardship grants, the need and opportunity to recreate the meadow grassland have been recognised since the 1980s, with several trials being undertaken

(Walker *et al.*, 2004). For example, about 6ha of the grassland was established on ex-arable land at Somerford Mead, Oxford, in 1986 and followed by a series of studies on its development and management (Woodcock *et al.*, 2005; McDonald, 2009). More recently, there has been seeding of 13.5ha of ex-arable land along the River Nene in 2007 and the reseeding of 30ha of semi-improved/degraded grassland on the River Ray in 2008 (Flood Meadows Partnership, *loc. cit.*).

The Light Owler Trust was also looking to create about 5.6ha of meadow grassland on semi-improved pasture grassland at its South Grange Farm in the East Riding of Yorkshire in 2000. This had been purchased with the aid of UK Coal Ltd as off-set mitigation for the environmental effects of underground mining in the River Derwent Valley (Carstairs, 2007). Other possible MG4 creation sites along the nearby River Derwent had been considered but these were assessed as prone to long durations of winter flooding, which has been demonstrated to be detrimental to the persistence of the grassland (Benyon, *loc. cit.*). In 2002 and 2003 trial strips were set up to inform the best approach to establishing the Meadow Foxtail–Great Burnet grassland at South Grange Farm prior to the seeding of a larger area in 2005. This paper reports the findings after ten years, the achievements and the lessons learnt.

South Grange Farm

South Grange Farm lies between the villages of Barlby and Pockington, c.1.5km south-east of the hamlet of Ellerton (see Plate IV, centre pages). It originally comprised c.68ha of a mixed farming unit of pasture and arable land use. The Light Owler Trust on acquiring the Farm aimed to create 5.6ha of MG4 grassland and c.14ha of grassland suitable for wintering birds, whilst maintaining the remainder as productive arable land to fund the proposed conservation work.

The Farm is situated on the middle/upper terrace of the Lower Derwent Valley c.2.5km east of the River Derwent at c.9m AOD and 3m above the current floodplain level. Unlike the active floodplain, as described by Parkin *et al.* (2004), the farmland is not subject to river inundation. It was enclosed under the 19th century Enclosure Acts and the grassland displays remnants of shallow ridge-and-furrow, created to promote surface drainage. This river terrace is drained by ditches maintained by the local Internal Drainage Board (IDB) as well as a number of connecting field ditches.

The typical soils of the proposed MG4 grassland area are: thin silty loam and very fine sandy loam upper topsoil over a silty clay loam, sandy clay loam and medium clay lower topsoil over a heavy clay loam and clay at a depth of 25cm. The soils are likely to belong to the Foggathorpe 2 Association described as slowly permeable, seasonally waterlogged, clay and fine loam over clayey-stoneless soils of glacio-lacustrine drift and till (Soil Survey of England & Wales, 1983). The fertility characteristics of the pasture are given in Table 1.

Table 1. Soil fertility (soil reaction and extractable nutrients) within the trial enclosure.

Number of Samples = 12	pH	P mg/l	K mg/l	Mg mg/l
Median	5.9	4	71	235
Range	5.7 – 6.2	3 - 5	57 - 87	175 - 269

The existing pasture vegetation prior to the setting up of the trial comprised species-poor sward dominated by Common Bent Grass *Agrostis capillaris* with a low frequency of Sorrel *Rumex*

acetosa and Meadow Buttercup *Ranunculus acris* with occasional Perennial Ryegrass *Lolium perenne,* Yorkshire Fog *Holcus lanatus* and Creeping Bent *Agrostis stolonifera.* This indicates a typical Perennial Ryegrass-Crested Dog's-tail *Lolium perenne-Cynosurus cristatus* pasture grassland (NVC MG6, Rodwell, *loc. cit.*). The South Grange Farm grassland was of a different character, comprising Meadow Foxtail, rushes and Tufted Hair-grass *Deschampsia cespitosa* in association with furrows, and probably having strong affinities to the Yorkshire Fog-Tufted Hair-grass *Holcus lanatus – Deschampsia cespitosa* NVC MG9 type (Rodwell, *loc. cit.*).

The Trial

Specifications for Trial Strips

The trial comprised two ground preparation options of cultivated (C) or not cultivated (N) before seeding. Strips (100m x 4m repeated twice (I.e. 800m^2)) were prepared and seeded in 2002/2003 and repeated in 2003/2004.

In 2002/2003 the following actions were undertaken. The C-Strip was treated with glyphosate on 1 October 2002, ploughed in February 2003, rotovated on 5 May and 12/13 July and 'green-hay' from the nearby Ellerton Ings was cut and spread on the strip on 16 July and turned on 18 and 29 July. The N-Strip had no cultivation and green-hay was spread on 16 July 2003 and turned on 18 and 29 July. The standing grass sward was cut and removed on 15 August.

In 2003/2004, the C-Strip was treated with glyphosate on 27 October and ploughed in January 2004, rotovated on 19 July, spread with green-hay from Ellerton Ings on 30 July followed by removal of hay on 28 September. The N-Strip was chain-harrowed on 29 July followed by spreading of green-hay on 30 July and removal of hay on 28 September.

Specification One Acre Plot

The preparation for the larger scale One Acre Plot (K) comprised spraying the existing vegetation with glyphosate on 30 May 2005, discing the area on 13 June and power-harrowing on 26 July. A green-hay crop was harvested with a forage harvester from Ellerton Ings on 27 July and spread by manure spreader. The hay was turned on 8 and 16 August followed by sheep grazing in early October to reduce the 'hay thatch'.

Remainder of the Enclosure

The remainder of the fenced enclosure around the trials (R) was not cultivated in 2005 but was strewn with green-hay from Ellerton Ings on 27 July by manure spreader. The hay was turned on 8 and 16 August followed by sheep grazing in early October to reduce the hay thatch.

Management of Strips and One Acre Plot

The established plots were cut for hay on 12 July 2003 and left to shed seed to promote recruitment. The hay was turned on 15, 18 and 29 July and baled and removed on 29 August. In 2004, the previous year's strips were cut on 29 July and the hay left to shed seed, turned on 27 July and removed on 17 August. Sheep were grazed on the strips from 28 September. The entire enclosure, comprising the One Acre Plot, the treatment strips and the remainder of the enclosure, was grazed from 3 October 2005.

From 1 November 2006 until 31 October 2013 the entire enclosure was managed as follows:

- A hay cut taken after 15 July and the aftermath grazed with sheep or cattle until 15 October
- No artificial fertilisers allowed but an annual application (20-30 tonnes/ha) of well-rotted farmyard manure in August or September
- No herbicides other than to deal with localised weed problems as prior-agreed with the Landlord
- No insecticides applied at any time.

Monitoring

The Light Owler Trust made two annual visits on 12 June 2003 and 30 June 2004 to review progress. Jeff Lunn, Trustee and Natural England Area Manager, made the first quantitative recording of the botanical composition of the strips and the One Acre Plot as well as nearby grassland on 1 July 2005. Subsequent recording was carried out by Paul Benyon on 11 July 2007, 24 July 2008, 21 July 2010, 29 June 2011 and 23 July 2012. The Remainder part of the enclosure was only sampled once on 23 July 2012.

Recording methodology followed that for NVC surveys (Rodwell, 2006). Plants present, their frequency and cover were assessed in randomly placed 2m x 2m quadrats in each of the strips and the One Acre Plot. The sample quadrats were restricted to the ridges in the ridge-and-furrow areas. The number of quadrats recorded in each year is given in Table 2.

Table 2. Number of quadrats sampled per recording year.

Recording Year	Plots			
	N	C	K	R
2005	5	10	-	-
2007	10	10	10	-
2008	10	10	20	-
2010	10	10	20	-
2011	10	10	20	-
2012	10	10	20	20

Results

As the treatments varied between years and there was limited randomisation, the trial could not be analysed as an experiment to partition treatment, year and background sources of variation. However, it was apparent at the time of recording that there were marked differences in establishment. The data in each year of monitoring was aggregated for each year of sowing (2002/3 & 2003/4) and treatment for the strips (C & N) and for the One Acre Plot (K).

<u>Non-Cultivated Strips (N)</u>

In 2005 (ie one and two years after seeding) the grassland communities in the N-Strips without any ground preparation prior to green-hay spreading were still dominated by the *in situ* plants of the impoverished MG6 grassland. In total ten plants were recorded with three (Creeping Bent, Yorkshire Fog and Tufted hair-Grass) being consistently recorded, with occasional Sweet Vernal-Grass *Anthoxanthum odoratum,* Creeping Buttercup *Ranunculus repens,* Meadow Buttercup and Sorrel.

Plate I. Wild Tulip *Tulipa sylvestris* (see p163).

Left: Some of the many flowers present at Cattal. *Linda Chapman*

Below: Several flowers were found with 7 or even 8 'petals' (tepals). *Roger Poyser*

Plate II. Tardigrades. (see p167).

Left: Paramacrobiotus richtersi has been found in VC61, VC63 and VC64. *Barry Natress*

Below: Diphascon scoticum with 3 eggs, photographed using the Jamin Lebedeff interference contrast technique. *Mike Smith*

Below left: Egg of *Paramacrobiotus richtersi.* *John Ramsbottom*

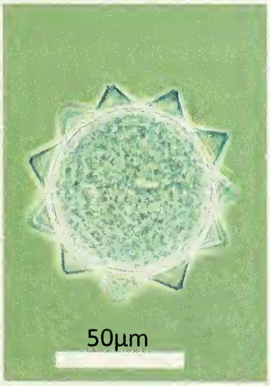


Plate III. Birds which no longer breed in Ainderby Steeple (see p181).

Above: Redshank *Tringa totanus*
Top right: Common Snipe *Gallinago gallinago*
Right: Sedge Warbler *Acrocephalus schoenobaenus* *Paul Simmons*

Plate IV. Location of South Grange Farm, showing the River Derwent and conservation-designated land (see p198).


Plate V. Colonization by aquatic plants at North Cave Wetlands (see p185-197):

Above: Bulrush *Typha latifolia* (left) and Celery-leaved Buttercup *Ranunculus sceleratus* (right) colonizing bare lake margin in July 2001.

Below: Soft-rush *Juncus effusus* (left) introduced in 2002 to the margin of Village Lake in coir rolls, seen in July 2004 and (right) Common Reed *Phragmites australis* established in Reed Bed Lake with Common Club-rush *Schoenoplectus lacustris*, July 2013. *Ray Goulder*


Plate VI. YNU Excursions 2014.

Top left: VC65. A new ruderal plant community on a gravel bar in the River Swale. *Terry Whitaker*

Top right: VC65. A veteran Hawthorn *Crataegus monogyna*, a source of several lichens, on the western rampart of Maiden Castle, Grinton. *John Newbould*

Centre left: VC64. Botanists deep in the study of the special flora of Austwick Moss. *Joyce Simmons*

Centre right: VC63. Bill Ely and Reserve Warden Mick Townsend examining a find at Thorpe Marsh Nature Reserve. *Joyce Simmons*

A Blood-vein moth *Timandra comae* (*bottom left)* and a Common Newt *Lissotriton vulgaris* (*bottom right*) were colourful finds on a dull day at Thorpe Marsh. *Colin Rew*

Two years later the community had changed markedly, having 25 plants, and a total of 35 recorded between 2007 and 2012. The grassland had 12 of the 14 constant species associated with the Ellerton Ings MG4 community, and 13 of the 15 constant MG4 species cited by Rodwell (1992) in the samples between 2007 and 2012 (Table 3). The two constant species absent from all sample quadrats were Common Dandelion *Taraxacum officinale* and Autumn Hawkbit *Leontodon autumnalis*. The apparent irregular recording of other plants in some years is probably due to their very low frequencies in the sward (hence a lower chance of being sampled).

Jefferson & Pinches (*loc. cit.*), in their monograph about MG4 grasslands in England, also comment on the more frequent occurrence of Creeping Bent, Cocksfoot *Dactylis glomerata,* Tufted Hair-Grass and Rough Meadow-Grass *Poa trivialis* and the presence of Meadow Brome *Bromus commutatus*, Smooth Brome *B. racemosus* and Meadow Barley *Hordeum secalinum* being a feature of the Lower Derwent MG4 meadows. Some of these were present at low densities in some of the sample quadrats. Their presence in the samples has a significant influence on the categorisation of the grassland community when using Rodwell's early account of MG4, and computer-aided comparison techniques using MATCH software (Malloch, 1990), and the outcome of this is that the newly established grassland has a typical MG6 (*Lolium perenne-Cynosurus cristatus*) character. The frequency of Great Burnet appears to be key, as where this has a high frequency, as in the quadrats recorded in 2010, the grassland has a strong affinity to Rodwell's MG4.

Table 3 Frequency Classes for Reference Sources and Monitored Area N (without ground preparation) 2007-2012.

	REFERENCE SOURCES		AREA N				
	NVC[1]	Ellerton Ings Transect 2000	2007	2008	2010	2011	2012
Ranunculus acris	V	II	II	V	V	V	V
Trifolium pratense	V		II	II	V	II	V
Plantago lanceolata	V		III		V	I	V
Cynosurus cristatus	V	II	V	V	V	V	V
Rumex acetosa	V	III	I		II		I
Filipendula ulmaria	V	I	I	I	II	I	II
Taraxacum officinale	V	II					
Lolium perenne	V	II	V	IV	V	V	V
Leontodon autumnalis	V						
Anthoxanthum odoratum	V	IV	V	IV	V	V	V
Trifolium dubium	V		I	III	II	I	III
Bromus hordeaceus	V	I		I	II		
Poa trivialis	V	IV			I		II
Festuca rubra	V	III	I		I	II	IV
Sanguisorba officinalis	IV	II	I	I	V		III
Holcus lanatus	IV	I	V	V	V	III	V

Alopecurus pratensis	III	IV	I	I	V	I	II
Silaum silaus	III	II			III		
Cerastium fontanum	II	I	I				
Agrostis stolonifera	II	IV	IV	V	V	V	
Deschampsia cespitosa	II	III	II	III	IV	I	II
Hordeum secalinum	II	I	I	I	I		I
Lathyrus pratensis	I	I	I	I	III	I	II
Ranunculus repens	I	III	IV		V		II
Festuca pratensis	I	I			II		
Cardamine pratensis	I	II					
Trifolium repens			I	I	V	I	II
Rhinanthus minor					I	II	III
Centaurea nigra						I	I
Lotus corniculatus				I		I	
Agrostis capillaris			I	I		II	V
Prunella vulgaris			II		I	I	II
Vicia cracca		II	I	II	II	I	I
Phleum pratense		I	II	I	III		I
Juncus effusus					I		1I
Oenanthe silaifolia		II			I		
Rumex crispus					I		
Agrostis canina		V	II				
Alopecurus geniculatus		I					
Elymus repens				I			
Achillea ptarmica		I					

[1] after Rodwell, 1992

Whilst the frequency of some of the constant MG4 plants, and particularly that of Great Burnet, Meadow-sweet *Filipendula ulmaria* and Meadow Vetchling *Lathyrus pratensis,* is lower than that cited by Rodwell, they are present and persistent in the community sampled within the strip without treatment (N) and can be judged to have a character of Lower Derwent MG4 meadow.

Cultivated Strips (C)

In 2005, in contrast to the unprepared N-Strip, the C-Strip with ground preparation had a total of 31 plants including a number of constant MG4 species which had been absent from the grassland before spreading the green-hay; these were Red Clover *Trifolium pratense,* Ribwort Plantain *Plantago lanceolata,* Great Burnet, White Clover *Trifolium repens,* Meadow-sweet and Common Dandelion. 13 of the 15 constant MG4 species cited by Rodwell (1992) were present in 2005 with one or two years of sowing with green-hay.

Two years later the grassland had 16 plants with 36 recorded between 2007 and 2012 (Table 4). The grassland had the same complement of species as Ellerton Ings, as well as published MG4 constant species as in the non-cultivated N-Strips. These latter species were also present between 2007 and 2012 in the C-Strips cultivated prior to the spreading of the hay, as well as grassland plants mentioned above as being typical of the Lower Derwent MG4 variant (Jefferson & Pinches, 2009). Consequently, computer analysis shows that the grassland has a typical

MG6(a) character owing to the relatively low frequency of Great Burnet.

Jefferson & Pinches (*loc. cit.*) refer to a number of scarce plants that are sometimes associated with MG4 grassland. The Narrow-leaved Water Dropwort *Oenanthe silaifolia* is a Nationally Scarce umbellifer and was recorded in 2005 and 2010 in one of the quadrat samples in C-Strip. This umbellifer is normally associated with standing and slightly flowing water. Meadow Barley is Locally Scarce but well represented, however, in the Derwent Valley grasslands where it has persisted in the re-created swards. The fortunes of Yellow Rattle *Rhinanthus minor* were also of interest, with an initial flush of abundance in the C-Strip but then a decline to a more minor component of the community.

Table 4 Frequency Classes for Reference Sources and Monitored Area C (with ground preparation) 2007-2012.

	REFERENCE SOURCES		AREA C				
	NVC[1]	Ellerton Ings Transect 2000	2007	2008	2010	2011	2012
Ranunculus acris	V	II	III	V	V	V	IV
Trifolium pratense	V		IV	IV	V	IV	V
Plantago lanceolata	V		V	V		V	IV
Cynosurus cristatus	V	II	I	V	V	V	V
Rumex acetosa	V	III	II	I	II		I
Filipendula ulmaria	V	I		II	II		IV
Taraxacum officinale	V	II					
Lolium perenne	V	II	IV	V	V	V	V
Leontodon autumnalis	V						
Anthoxanthum odoratum	V	IV	V	V	V	IV	V
Trifolium dubium	V			IV	II	I	IV
Bromus hordeaceus	V	I			II		
Poa trivialis	V	IV			V		II
Festuca rubra	V	III	IV		III		V
Sanguisorba officinalis	IV	II	I	II	II	IV	III
Holcus lanatus	IV	I	V	V	V	III	V
Alopecurus pratensis	III	IV		II	II	II	
Silaum silaus	III	II			III	II	II
Cerastium fontanum	II	I					
Agrostis stolonifera	II	IV	III	IV	V	III	
Deschampsia cespitosa	II	III	V	III	V	II	V
Hordeum secalinum	II	I		I		I	
Lathyrus pratensis	I	I		II		II	I
Ranunculus repens	I	III	V	IV	V	I	I
Festuca pratensis	I	I			I	I	
Cardamine pratensis	I	II					
Trifolium repens				V	III	V	II
Rhinanthus minor				I	I	II	IV
Centaurea nigra							I

Lotus corniculatus							I
Agrostis capillaris			II	IV		IV	V
Prunella vulgaris			II	I	I	I	IV
Vicia cracca		II		II	II	II	IV
Phleum pratense		I		I	I	III	
Juncus effusus						I	
Cirsium vulgare			I				
Oenanthe silaifolia		II					
Agrostis canina		V		II		I	
Alopecurus geniculatus		I					
Pimpinella saxifraga					V		
Achillea ptarmica		I				I	

The establishment of the other signal plant of the community, Meadow Foxtail, is also of interest. Whilst present in most of the samples, its abundance was quite variable, especially in the early years of development. However, the timing of the taking of the green-hay crop may well have played a part in this as the July donor cropping may have missed the best time for maximising the seed take for this early flowering species, resulting in a sparse establishment.

<u>One Acre Plot (K)</u>

This area of the trial enclosure was established in 2005 and had a total of 42 plants between 2007 and 2012 (Table 5). Thirteen of the 14 Ellerton Ings constant species and 14 of the 15 constant published MG4 species have been recorded in the Plot (which was cultivated prior to the spreading of the hay). This included both Common Dandelion and Autumn Hawkbit that were absent in sample quadrats within the strips. Unlike the N- and C-Strips, the bulky dicotyledon Meadow-sweet was absent from the One Acre Plot K.

Table 5 Frequency Classes for Reference Sources and Monitored Area K (with ground preparation) 2007-2012 and Area R (without ground preparation) 2012.

	REFERENCE SOURCE		AREA K					AREA R
	NVC[1]	Ellerton Ings Transect 2000	2007	2008	2010	2011	2012	2012
Ranunculus acris	V	II	II	V	V	V	V	IV
Trifolium pratense	V			II	II	II	II	IV
Plantago lanceolata	V		I	I	II	II	II	II
Cynosurus cristatus	V	II	V	V	V	V	V	V
Rumex acetosa	V	III	I		II	I	I	I
Filipendula ulmaria	V	I						I
Taraxacum officinale	V	II				I		
Lolium perenne	V	II	V	V	V	V	IV	IV
Leontodon autumnalis	V			I	I			
Anthoxanthum odoratum	V	IV	V	V	V	V	V	V
Trifolium dubium	V			I	I	I	V	V
Bromus hordeaceus	V	I		I	II	II		
Poa trivialis	V	IV			III	I		V

Festuca rubra	V	III			III	III	V	II
Sanguisorba officinalis	IV	II					I	
Holcus lanatus	IV	I	V	V	V	I	III	IV
Alopecurus pratensis	III	IV		III	V	V	IV	III
Silaum silaus	III	II					I	I
Cerastium fontanum	II	I		I	I	I	II	I
Agrostis stolonifera	II	IV	V	V	V	V		
Deschampsia cespitosa	II	III	V	V	V	IV	IV	IV
Hordeum secalinum	II	I	V	IV	II	III	III	II
Lathyrus pratensis	I	I			I	I	II	I
Ranunculus repens	I	III	V	V	V	II	I	III
Festuca pratensis	I	I			I	I		
Cardamine pratensis	I	II			I			
Trifolium repens					I	I	II	I
Rhinanthus minor					I	II	III	III
Centaurea nigra			I	II	II	II	IV	II
Lotus corniculatus								I
Agrostis capillaris				III	V	V	V	V
Prunella vulgaris			II	III	IV	III	II	III
Vicia cracca		II		I	I		I	I
Phleum pratense		I	II	III	II	III	II	I
Poa pratensis					I	I		
Juncus effusus					II			I
Cirsium vulgare							I	I
Oenanthe silaifolia		II	IV	II	V	III	III	
Agrostis canina		V				II		
Alopecurus geniculatus		I			I	I		
Elymus repens				I				
Lychnis flos-cuculi				I	II			
Pimpinella saxifraga							I	
Rhytidiadelphus squarrosus (a moss)								I
Achillea ptarmica		I						
Juncus conglomeratus			I	I				

Of particular note in Plot K has been the consistent presence of Narrow-leaved Water Dropwort in each of the recording years from 2007 to 2012 where, on average, 50% of the quadrats contained this scarce plant.

Remainder of the Enclosure (R)

Area R had 30 plants in 2012 and the same Ellerton Ings and published MG4 constant ones as recorded for the N- and C-Strips and Plot K, along with the Lower Derwent additional grasses (Table 5).

Discussion

Establishment of MG4 grassland at South Grange Farm

The hay was taken from part of Ellerton Ings where grassland of a lower Derwent MG4 type (*sensu* Jefferson & Pinches, 2009) is known to occur, but within the same field, other wetter grassland communities are also present. Column 2 in Tables 3, 4 and 5 gives the constancy values for the species cited by Rodwell (1992) for MG4 grassland and column 3 in the tables gives the constancy of species recorded along a transect (including some wetter areas of non-MG4 vegetation) across the northern field at Ellerton Ings in 2000. No records were made of the botanical composition or seed maturity/prior dispersal at the time the hay was harvested. The species and amount of viable seed introduced is likely to vary between years because of different plant phenologies and suitable conditions for seed set (Humphries, 2012), and could account for the difference in communities established in the One Acre Plot (K) and the Strips N and C, and also account for the absence of the two composites.

Although no records were made of the botanical composition or seed maturity at the time the hay was harvested, the newly established grassland at South Grange Farm has almost the full suite of the Ellerton Ings and NVC MG4 constant species, in particular the two bulky dicotyledons Great Burnet and Meadow-sweet, as well as other specialist wet grassland plants such as Narrow-leaved Water Dropwort. This also suggests that the grassland established is a result of the seeding.

The presence of Great Burnet, Meadow-sweet and Meadow Vetchling in the treatments C, N, and K suggests that a character of a NVC MG4 meadow community has become established. Interestingly, the communities within N and C are indistinguishable from each other. Despite the absence of Meadow-sweet in Plot K, this community also has a character of NVC MG4 meadow and is similar to those of the two trial strips. The community sampled within the remainder of the enclosure (R) also had a character of NVC MG4 meadow. The communities within the two strip treatments, the One Acre Plot and area R are also largely indistinguishable from each other.

The apparent stronger tendency to affinity with MG6 grassland rather than MG4 meadow appears to result from the frequency of three bulky dicotyledons (Great Burnet, Meadow-sweet and Meadow Vetchling) within the quadrat samples. Clearly, the sowing has markedly changed the grassland communities on South Grange Farm towards an Ellerton Ings MG4 type. Given there was only one sowing from a general hay cut, with further seeding of these and other less well represented or 'absent' plants, the sown MG4 community is likely to have had a much stronger affinity to NVC MG4 meadows and less towards the MG6 pasture type.

The apparent variation in the presence and frequency of some plants between years is also a manifestation of randomly sampling a variable distribution of plants rather than being symptomatic of their disappearance and reappearance. Taking this into account, the data suggest that once plants are established they persist and provide a stable community. This is indicative of the soil and management conditions being favourable for establishing MG4-like grassland at South Grange Farm. For those plants that might be considered to be under-represented or absent, further over-sowing could be a way to ensure their establishment and a fuller complement of constant and scarcer species.

Given that only a single application of green-hay was applied, it is indicative that the establishment of the MG4 meadow community is relatively easy to achieve given appropriate site and seed source.

MG4 establishment trials and schemes elsewhere

Historic attempts to establish MG4 grassland report successful and persistent communities (Walker *et al., loc. cit.;* McDonald, *loc. cit.*). The more recent Flood Meadows Partnership (*loc. cit.*) initiatives on the River Ray and River Nene suggest that here it is early days and the situation could be similar to South Grange Farm where it took two to three years before establishment was evident.

It is interesting to note that the green-hay method has been widely and successfully used in establishing other grasslands (Atkinson *et al.* (*loc. cit.*); Walker *et al.* (*loc. cit.*); Flood Meadows Partnership, (*loc. cit.*)). The examples include cultivated land as well as sowing into established grassland where cultivation was considered to be necessary.

It appears that the preparation of the land and existing grassland, provided that it is unproductive (nutrient poor) and species poor, is not of such importance as initially anticipated, given that appropriate site conditions and management are provided, as pointed out by Gowing *et al.* (*loc. cit.*), Duranel *et al.* (2007) and McDonald (*loc. cit.*).

There is seemingly no botanical difference between the two preparation treatments in the establishment of the MG4 meadow communities in the species-poor, short, semi-improved grassland at South Grange Farm. However, establishment was markedly slower on the Non-cultivated Strip, leading to the decision to adopt the cultivation approach for the One Acre Plot. However, after about three years, the initial difference had disappeared.

Scope for MG4 community creation

Wheeler *et al.* (2004) considered that “If a stand of MG4 has been recently lost, but is still under non-intensive grassland management, then corrective management may rehabilitate the community in the short to medium term (e.g. 5-20 years)” as appears to have been the case at South Grange Farm. The findings and experience gained at South Grange Farm are supported by other reports of successful achievements.

The *in situ* plant communities at South Grange Farm were typical of semi-improved MG6 grasslands and of a type commonly found in the floodplains of England as, for example, at Hoveringham Pastures in Nottinghamshire (Natural England, 2010), which has resulted in its denotification as a SSSI. Given the success of the conversion of the MG6 grassland to a MG4 meadow type at South Grange Farm, this suggests that MG6 grassland sites such as Hoveringham Pastures may be candidates for re-establishing MG4-like meadows.

The successful achievement at South Grange Farm also questions the dependency of these grasslands on flooding, thereby implying that the MG4 grassland had a far wider distribution in the past than just the margins of alluvial floodplains. This is logical in that agricultural improvement took place preferentially away from flooded areas, resulting in the early loss of MG4 meadows, leaving them to hang on in areas where improvement was not profitable on un-

drained floodplains. Given this, as is suggested in Jefferson & Pinches (*loc. cit.*), MG4 meadow communities would probably have had a wider spectrum of community variants than the implied single type described by Rodwell (1992). This raises the prospect that a wider perspective might be taken in the future when considering opportunities for the establishment of MG4 and MG4-like suites of grassland communities.

Conclusions & Recommendations

The basis for a grassland community of a type similar to the Lower Derwent MG4 meadows as described by Jefferson & Pinches (*loc. cit.*) and the generalised MG4 type described by Rodwell (1992) has been established at South Grange Farm. The tendency for the community being a little more like NVC MG6 than MG4 is simply dependent on the frequency of the bulky dicotyledons Great Burnet, Meadow-sweet and Meadow Vetchling which, of course, could be increased by further sowing.

In terms of establishment practice, the initial conversion of the *in situ* grassland is likely to benefit from cultivation as this seems to give quicker establishment, but successful supplementary sowing is not dependent on wholesale re-cultivation. However, the periodic removal of the standing crop during the establishment phase and minor cultivation such as creating slots is likely to be necessary to ensure the establishment of the supplementary sowings in established grassland.

Given the above, it can be concluded that the original purpose of establishing MG4 grassland as off-site benefit and mitigation for the potential effects of mining close to the Lower Derwent Ings has been achieved in principle, leaving its persistence and development to the implementation of traditional management practices and some further over-sowing, as recommended above.

Acknowledgements

We are grateful to the Trustees of the Light Owler Trust for allowing us to monitor their trial and to publish our findings. The views expressed are those of the authors and may not be those of the Trust or Natural England.

Mr W. Ward is thanked for his expertise and commitment in undertaking the organisation of the ground preparation, the collection and spreading of the green-hay, Mr N. Turton for organising the aftermath grazing and maintenance of the enclosure fencing; and Mr S. Charlesworth for the supply of Ellerton green-hay.

Alan Booth of Natural England is thanked for his preparation of Plate IV.

References

Atkinson, M. D., Trueman, I. C., Millett, P., Jones, G. H. & Besenyei, L. (1995). The use of hay strewing to create species-rich grasslands, (ii) Monitoring the vegetation and seed bank. *Land Contamination & Reclamation*, 3 (2): 108-110.

Benyon, P. R. (2003). *Soil Wetness as a Determining Factor in the Distribution of MG4 (Alopecurus pratensis - Sanguisorba officinalis) Grassland*. Master of Philosophy Thesis, University of Nottingham.

Carstairs, I. (2007). *The Yorkshire River Derwent: Moments in Time*. Halsgrove Discover Series, Wellington.

Duranel, A. J., Acreman, M. C., Stratford, C. J., Thompson, J. R. & Mould, D. J. (2007). Assessing the hydrological suitability of floodplains for species-rich meadow restoration: a case study of the Thames floodplain, UK. *Hydrology and Earth System Sciences*, 11 (1): 170-179.

Flood Meadows Partnership (2014a). Restoration Case Study: Broad Meadow and Middle Park Restoration Project. http://www.floodplainmeadows.org.uk/files/floodplain/d118165.pdf Accessed 24/02/2014.

Flood Meadows Partnership (2014b). Restoration Case Study: Restoration of the Upper Ray Meadows Nature Reserve, Buckinghamshire. http://www.floodplainmeadows.org.uk/files/floodplain/d117799.pdf Accessed 24/02/2014.

Gowing, D. J. G., Tallowin, J. R. B., Dise, N. B., Goodyear, J., Dodd, M. E. & Lodge, R. L. (2002). Research Report Number 446: *A review of the ecology, hydrology and nutrient dynamics of floodplain meadows in England.* English Nature, Peterborough.

Humphries, R. N. (2012). Lessons learnt for harvesting seed from semi-natural grasslands for biodiversity mitigation and enhancement schemes in the UK. *in* R.I. Barnhisel (Ed.) *Proceedings of Annual National Meeting of the American Society of Mining and Reclamation: Sustainable Reclamation, June 8-15, 2012*. Tupelo, Ms, USA.

Jefferson, R.G. & Pinches, C.E. (2009). *The conservation of floodplain meadows in Great Britain: an overview.* http://freespace.virgin.net/frances.watkins/fritillary/frit5.htm Accessed 24/02/2014.

Malloch, A.J.C. (1990). *MATCH - a computer program to aid the assignment of vegetation data to the communities and sub-communities of the National Vegetation Classification*. Unit of Vegetation Science, University of Lancaster.

McDonald, A. W. (2009). *The effect of management on the biodiversity of a recreated floodplain meadow in the upper Thames valley: a case study of Somerford Mead.* http://freespace.virgin.net/frances.watkins/fritillary/frit5/somerford.pdf Viewed 24/02/2014.

Natural England (2010). *Hoveringham Pastures SSSI, Nottinghamshire - Supporting Information: A supplement to the denotification document*. Natural England, Nottingham.

Parkin, G., Birkinshaw, S., Humphries, N., Benyon, P., Humphries, C., Bently, M & Gilman, K. (2004). Project BD1316 - *Water Availability and Budgets for Wetland Restoration and Re-creation Sites.* Defra, London.

Rodwell, J. S. (1992). *British Plant Communities Volume 3 – Grasslands and montane communities*. Cambridge University Press, Cambridge.

Rodwell, J. S. (2006). *National Vegetation Classification: Users' handbook*. JNCC, Peterborough.

Soil Survey of England & Wales, 1983. *Soils of Midland and Western England: Sheet 3*, 1:250,000 scale. Ordnance Survey, Southampton.

Walker, K.J., Stevens, P.A., Stevens, D.P. Mountford, J.O., Manchester, S.J. & Pywell R.F. (2004). The restoration and re-creation of species-rich lowland grassland on land formerly managed for intensive agriculture in the UK. *Biological Conservation* 119: 1–18.

Wheeler, B. D., Gowing, D. J. G., Shaw, S. C., Mountford, J. O. & Money R. P. (2004). *Ecohydrological Guidelines for Lowland Wet Plant Communities*, (eds Brooks A W & Whiteman M I). Environment Agency, Anglian Region, Peterborough.

Woodcock, B.A., Mann, D.J., Mirieless, C., McGavin, G.C. & McDonald A.W. (2005). Re-creation of a lowland floodplain meadow: management implications for invertebrate communities. *Journal of Insect Conservation* 9: 207–218.

Leeds Naturalists' Club 1870 - 2014

Peter Larner
email: peter.larner@dsl.pipex.com

The Leeds Naturalists' Club and Scientific Association, to give it its full name, was founded in 1870. We know this because it says so on our annual syllabus card, but detailed knowledge of this event and how it came about has hitherto been lacking. However, a contemporary account contained in one of the very few old documents we possess gives the answers (see p216 for documents consulted).

The Early Years - Foundation

The Club was formed as the result of a talk given by a Mr James Brodie in February 1870 to members of the Leeds Young Men's Christian Association, in which he explained the working of a similar society in Dundee. It was resolved to form a society in Leeds and this met for the first time on 12 April 1870. The name adopted by the club was The Leeds Naturalists' Field Club.

At about the same time there was a private Scientific Association in Leeds, a group of five men who met informally each week in the house of one or other of its members for the purpose of reading papers and discussing matters of scientific interest. This society was gradually absorbed into the Leeds Naturalists' Field Club, an arrangement that was formalised in 1872 by the creation of the Leeds Naturalists' Field Club and Scientific Association. The opening meeting of this re-named organisation was held on 16 April 1872. The word 'Field' was removed from the title shortly afterwards. One of the 'five gentlemen' was F. Arnold Lees (1847–1921) who is best remembered for his *The Flora of West Yorkshire* (Lees, 1888) but, although botanical reports by Lees for 1873 and 1874 were in the Club library in 1876, his name does not appear in the lists of members from 1876 and 1890.

Activities

In the first year of the newly established Club it was resolved that meetings should be held weekly on Tuesday evenings and that they should be devoted alternately to the reading of papers and the exhibition of specimens and conversation. During the year 22 papers were read and there were five excursions which, although a reduction on the previous year, were "productive of great interest to those members who took part in them".

The 21st Annual Report (1890) notes that 36 meetings, not including excursions, had been held during the previous year. Eleven had been held in the Library of the Leeds Philosophical and Literary Society on Park Row, four at the Leeds Medical School and the remaining 20 at the Club's room in the Municipal Buildings. Three of these were practical evenings and there were six which could broadly be classed as general exhibits meetings. There were eight summer excursions.

This pattern of meetings has been maintained over the years, although with fewer meetings. General Exhibits meetings, which had been relegated to four or five summer evenings, were abandoned quite recently, partly because of an increasing reluctance of members to collect

specimens.

One notable visitor to Leeds in 1890 was Professor O.C. Marsh of Yale University who was, and still is, famous for his discovery of an amazing number of dinosaur fossils. It is recorded that he presented the Club with a series of his papers on American Palaeontology.

First Members

The Club's membership was given as "about 50" in 1871 and 32 in 1872 but the list of 1876 shows 108 members, all of them male. There was a rather complicated fees structure under which the cost of membership, either 4/- or 5/- per annum, was determined by the date when the member had joined the club. Non-resident members paid 2/6 and honorary members were required to pay "not less than 10/6 per annum", quite a sizeable sum in those days. Life membership cost £5.

By 1890 the membership list showed 201 ordinary members and 15 honorary and life members. Amongst these were Lord Walsingham of Merton Hall at Thetford, Sir Edwin Gaunt of Carlton Lodge in Leeds and Dr Henry Clifton Sorby FRS of Sheffield, who is commemorated in the natural history society of that name in Sheffield.

Several members were significant figures in Victorian Leeds. Mr E.J. Arnold of No 3 Briggate was the founder of the firm that bore his name and which became probably the largest supplier of educational stationery and equipment in the country. Two very active members, Mr R. Reynolds FIC[1] and Mr F.W. Branson FIC, must surely have been the founders of Reynolds and Branson Ltd of Lower Briggate, suppliers of laboratory equipment to schools, colleges and hospitals and indispensible in the 1930s and 40s to schoolboys with chemistry sets. Other prominent citizens have been identified and further research would no doubt find more. 17 of those listed appear to have been doctors (mostly surgeons), one was a dentist and 14 have degrees or professional qualifications. There were 8 women members and 3 MPs.

One member who probably deserves a whole article to himself is Louis Compton Miall (1842–1921), who came to Leeds in 1871 when appointed Curator of the Leeds Philosophical and Literary Society's Museum. In 1876 he was appointed Lecturer in and later Professor of Biology at the Yorkshire College and, when Leeds University was founded in 1904, he became its first Professor of Biology. This is really quite surprising as his formal education is said to have ended when he was about 15 years of age. It is also stated that he attended the Leeds Medical School, but for how long and with what result is not known. He was also known for having dissected an elephant from a travelling circus that had died in Leeds in 1874. The dissection took three years to finish.

Miall was born in Bradford and was related, through his mother, to the Mackenzie family that included amongst its members Compton Mackenzie the novelist and Fay Compton the actress. He wrote 23 books, the first as co-author, on the flora of the West Riding in 1862. He is remembered at Leeds University by the Miall Lecture Theatre and the LC Miall Building, the home of the School of Biology.

---

[1] Fellow of the Institute of Chemistry

The University Years

There is a gap in our documentary evidence from the Transactions of 1890 until the start of the Club's Council Meetings Minute Book beginning in 1925 and continuing to the present.

Leeds University was founded in 1904 and, when we open the minute book, we find that the Club was then firmly established within the orbit of the University. How this came about we do not know but we find that Professors W. Garstang and J.H. Priestley were honorary Council members in 1926. Over the following years several other University biologists were honoured in this way. Dr Pearsall (later Professor W.H. Pearsall FRS, the author of *Mountains and Moorlands* in the *New Naturalist* series) is also recorded in the minutes, and many other members of the University appear in the following years, taking office, writing minutes, acting as recorders and generally showing considerable commitment to the Club. This involvement of University biologists must have been an inspiration to many of the ordinary members; a more practical benefit probably was the arrangement that allowed the Club to hold its meetings in a University lecture theatre. We do not know when this arrangement began but it is possible that it began with Professor Miall (a member of the Club since its early days) and that it might even date back to the days of the Yorkshire College.

One University botanist deserves special mention. William Arthur Sledge (1904–1991) first figures in a minute in 1925 and he appears to have continued as a Council member more or less continuously, holding a variety of offices up to 1990, although he did not attend in the last year or two of his life owing to poor health. Dr Sledge was a leading Yorkshire botanist for a large part of the 20th century, and a President of the YNU and Editor of *The Naturalist* for many years. It is remarkable that he was able to continue his association with the Club for so long when he was no doubt busy in several other areas, not least as Reader in Botany. In his last published work (in Lavin & Wilmore, 1994) he records how, as a schoolboy, he visited Dr Arnold Lees, taking specimens for identification and thus establishing a link between West Yorkshire botany of the 1870s and that of much of the 20th century.

Membership

In 1938 life membership was offered at a fee of £5/5/-, almost the same as in 1876. The ordinary membership fee was raised to 5/- in 1963, just what it had been in 1872 and, with the change to decimal currency in 1971, it was raised again to 40 pence. It was raised to £1 in 1976 and further increases followed as the cost of living rose. The annual fee is now £10.

These minutes do not tell us very much about the day-to-day life of the Club; Council meetings were normally held only once a year until 1975, when a proposal for two meetings a year was adopted, and were mainly concerned with proposals for officers and the programme for the coming year. It is clear, however, that the pattern of meetings which began in the 1870s still continued fundamentally unchanged.

Membership figures are mentioned only infrequently in this period but in 1928/9 there were 145 members and 96 in 1949, Towards the end of the 20th century increasing amounts of business were conducted in Council meetings and more frequent statements of numbers were given. For several years membership hovered around 100 then was followed by a gradual decline to 53 in 2009 and to 44 in 2010.

Protest, Conservation and Surveys

The Club appears to have been rather inward-looking during the 1920s and 30s. This is hardly surprising: interest in natural history was not widespread, the conservation movement had hardly started and nature reserves were few. The pace of agriculture was dictated by the speed of the horse and the flood of artificial fertilisers and pesticides was still to be unleashed. An early concern about environmental change was the suggestion in 1928 that the Club should protest about the "cutting up" of the Meanwood Valley by the creation of a Ring Road. This was not proceeded with as it was thought (no doubt accurately) that protest would be useless.

Conservation

Wildlife conservation gained momentum during the 1960s, 70s and, particularly, the 1980s, when there seemed to be a surge of interest in the natural world. Several environmental groups became active in Leeds in this period with two of them, Eye on the Aire and the Leeds Urban Wildlife Group, perhaps filling a vacuum that the Club was not equipped to fill but both relying to some degree on the expert knowledge held by Club members. Although interest in these new groups was strong in the late 1980s and early 1990s the tide of enthusiasm ebbed away and neither of them survived very long into the 21st century, perhaps in the case of Eye on the Aire because its basic purpose, the reduction of pollution in the River Aire, had largely been achieved. The Club, which had been a long-time supporter of the Yorkshire Wildlife Trust, supported several of these recently formed groups and appointed its own Conservation Secretary in 1986. In 1994 the Club decided to be involved with City Council conservation targets and in 1996 agreed to be one of the organisations supporting the formation of the Rodley Nature Reserve.

Surveys

Surveys of the Club's area should have been a basic activity but no formal project appears to have been undertaken until, in 1936, it was decided to undertake "an intensive floristic and faunistic survey on systematic and ecological lines in the Meanwood Valley from Adel Bridge to the Ring Road", the results of which would be published. Also to be published were "entomological lists of the Leeds area drawn from the Club's own record books". A Publications Committee was formed but there is no record that the Meanwood Valley survey was published; however, a minute of November 1937 reports that entomological lists were published in *The Naturalist* in that year (Hincks, 1937; Dibb, 1937).

In 1957 It was suggested that the Club should conduct an investigation into either the flora of the City of Leeds (a rather ambitious project)[2] or the flora etc. of the Meanwood Valley, which was agreed, and some progress was noted in 1958. In 1967 reference was made to the Bardsey Beck investigation, which was apparently proceeding, and an investigation to be made at Hetchell Wood with a strict time limit for completion.

In 1970 surveys of the Leeds and Liverpool Canal and the Aire and Calder Navigation were proposed. In 1976 the Hetchell survey was published as a 'preliminary report' and 100 copies

---

[2] It is worth noting that a Flora of Leeds and District compiled by students of the Swarthmore Educational Centre directed by Dr G.A. Nelson, the proposer of this survey, was published in 1963 (Nelson, 1963).

were printed, though I am not aware of whether any still exist. In 1978 a draft of the Meanwood survey was produced but in 1979 it was minuted that the Club could not afford to publish it. A survey of the whole of the Leeds Metropolitan District was proposed in 1983 while in 1987 it was recorded that work on the Meanwood survey was proceeding with a view to publication in 1990. However, there is no evidence that any of the surveys apart from that on Hetchell Wood was separately published, but the Club's Newsletter (1980-1984) published numerous elements of contemporary surveys of mammals, birds, molluscs, insects, bryophytes, fungi and lichens from the Meanwood Valley, the Leeds and Liverpool Canal and Hetchell Wood. Sadly, although during the whole of the Club's history much work was carried out and some hundreds of completed record cards are still in existence, very few of these records were published and very few appear now to be readily accessible.

The Second World War

There is no reference to the 1939/45 war in the minutes but the normal November meeting did not happen in 1939; there was, however, an extra meeting in January 1940. This meeting and the normal November meeting were held at the Leeds City Museum but the fact that the museum was badly damaged in an air raid in 1941 is not mentioned. It appears that Club meetings during the war were not held at the University.

Excursions

With the increase in motor car ownership it became possible to arrange evening excursions to places not served by public transport and annual visits to the Yorkshire Dales or elsewhere that would have been impossible without private transport. In 1980 there was a suggestion that an outdoor meeting should be held on motorway verges. Not surprisingly, this suggestion was not taken up.

The Ordinary Member

In the 1950s and 60s many of the long-standing University biologists had left the Club and, whether because of the change in emphasis away from field studies or the pressure of increasing numbers of students, fewer new academics were joining. In the 1970s the affairs of the Club appeared to be in the hands of what might be called the ordinary members and it is remarkable to find so many outstanding naturalists who made large contributions. Some who stand out for their long service and for their willingness to take on duties and responsibilities can be indentified from the Club's minutes and from the recollections of those who were members at that time: Dr John H. Elliott, a biology lecturer at the Leeds College of Technology who was Secretary for many years, Dr G.A. Nelson, a university pharmacologist who also occupied many Council posts, John Flint, a librarian by profession and a conservationist and a leading entomologist with a special interest in Coleoptera, and Dr R. Henson who had an interest in Zoology. Also prominent in this period were John Armitage who, after half a lifetime as a professional naturalist, was Curator of Biology at Leeds City Museum and expert in many fields, and Mr T. Cockerline, a keen botanist and member for many years who did much of his botanising in the Meanwood Valley. Current and recent members, many of whom have similar levels of expertise and a similar commitment to the Club's affairs, have not been included in this survey as it would be invidious to select a few when so many deserve to be mentioned. Perhaps another opportunity to take a deeper look at the Club's active and enthusiastic members will present itself at some future time.

Changing Times

At the beginning of the 19th century few people studied natural history. The image we have today, which may not be completely accurate, is of country parsons such as Gilbert White with time to spare or landed gentry who, perhaps, combined their studies with the collection of trophies for the cabinet. In 1870, when the Club was formed, the leading members seem to have been drawn from the emerging and increasingly prosperous middle class that had benefitted from the introduction of the railway, improved access to education and the beginnings of modern society. Several of these men made an impact on the life of Leeds and they were, perhaps, inspired by the Victorian ideal of self-improvement and enthused by the frequent lectures on scientific as well as natural history subjects.

By 1925 when our minute book starts all this had changed. If there were any entrepreneurs amongst the members then we do not hear about them. However, the influence of Leeds University was very strong and this support no doubt provided a stimulus to a wider group of naturalists and membership remained buoyant, although the study of natural history remained a minority interest. The surge of interest in the 1970s and 80s stemmed, perhaps, from the growing numbers of nature reserves and the realisation that people, not necessarily naturalists, working together could influence the course and extent of development and, by submitting evidence to public enquiries, could mitigate some of the harmful environmental effects of proposals from developers, local authorities and other statutory bodies.

Few local authorities employed even one ecologist when this movement started and the weak provisions of the Countryside Act of 1963 were mostly ignored. A much stronger duty was placed on statutory bodies with the passing of the 1981 Wildlife and Countryside Act and development plans began to include substantial sections on environmental protection. The feeling that the battle had been won might account for the sudden loss of interest by those people who had joined the conservation movement with such enthusiasm in the 1980s.

Given the growing division between the University biologist and the naturalist, together with concerns about security, health and safety and rising student numbers, it was perhaps inevitable that the Club's association with the University should come to an end in 2010 after probably a century of co-operation.

The Future

The future of the Club, like the future of the amateur naturalist in general, seems doubtful. Nature conservation has been taken over by the professionals, whose aims do not always coincide with those of the amateur naturalist. Professionals come and go and it seems that only the dedicated amateur with a long-term commitment to a site will have the necessary background to monitor the performance of the "conservation profession".

Although there may well be an increasing number of people with a benevolent interest in wildlife there does not seem to have been a corresponding increase in naturalists keen to take part in the investigation and recording of wildlife. This is increasingly important when environmental change can be so far-reaching and can take effect so quickly. It is particularly sad that so few young people are joining naturalists' societies. Without new and younger members with energy, initiative and knowledge, the future is indeed bleak.

Many possible reasons have been put forward for the decline of naturalists' clubs but perhaps their rise and current decline should be seen as part of, and stemming from, changes in the wider society over the past two centuries. It seems likely that society will continue to change and with those changes there will no doubt be changes in the study of natural history. The Club is now well into its second century but still many years away from its 200th birthday. The important question today is not whether it will reach that goal, but will it be able to celebrate 150 years of existence in 2020?

Acknowledgements

I am grateful to Mrs Phyl Abbott and Dr Peter Tannett for information drawn from their long experience of the Club and its members. If there are any errors they will be mine.

Leeds Naturalists' Club & Scientific Society documents consulted:

6th Annual Report 1875-6
Constitution 1876
Transactions 1890
Council Meetings Minute Book 1925 to present

The first three documents, in the possession of the author, are probably the only ones in existence. The Minute Book is held by Club officers.

References

Dibb, J.R. (1937) The Coleopterous Fauna of the Adel District of Leeds *in* Firth, J.D. Occasional Papers of the Leeds Naturalists' Club and Scientific Association. *The Naturalist* 62: 312-320.

Hinks, W.D. (1937) Sawflies of the Leeds District. Part I *Tenthredini in* Firth, J.D. Occasional Papers of the Leeds Naturalists' Club and Scientific Association. *The Naturalist* 62: 310-312.

Lavin, J.C. & Wilmore, G.T.D. (eds) (1994) *The West Yorkshire Plant Atlas:* 20-25. City of Bradford Metropolitan Council, Bradford.

Lees, F.A. (1888) *The flora of West Yorkshire with a sketch of the climatology and lithology in connection therewith*. Lovell Reeve & Co., London.

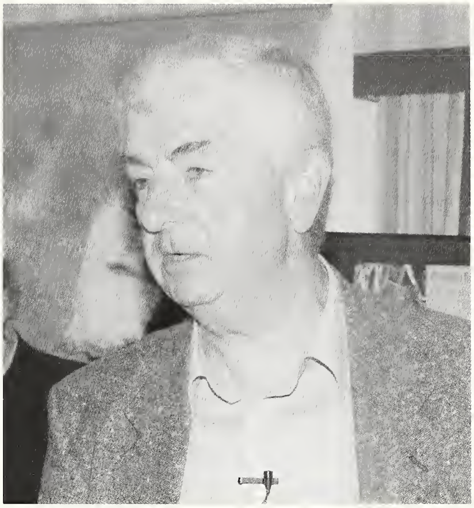
Nelson, G.A. (1963) A Flora of Leeds and District Compiled by Students of the Courses of Botany of Swarthmore Educational Centre Directed by G. A. Nelson. *Proceedings of the Leeds Philosophical and Literary Society Scientific Section* IX: 113-170.

Norris, A. (ed.) (1980-1984) *Leeds Naturalists' Club and Scientific Association Newsletter,* 1-10.

Leeds Naturalists' Club & Scientiific Association (1937) Occasional papers of the Leeds Naturalists' Club and Scientific Association. *The Naturalist* 62: 305-320.

Information on Professor LC Miall from Wikipedia

Obituary: John Wint 1946-2014



Like some of the best Yorkshiremen John wasn't born in the county, but he grew up and was educated in Sheffield where he developed his life-long interest in birds. This interest, in his own words, was `never really activated' until his late twenties, by which time he was well into a career as an insurance claims manager and living in Wakefield. This gave him easy access to Wintersett Reservoir where he trained as a bird ringer with the newly formed Wintersett Ringing Group, remaining as a stalwart of the Group in the late 1970s and 1980s. However, his ringing activities were soon extended to other localities, including wader ringing on the Humber and annual trips to Spurn Bird Observatory.

After moving to the Selby district in the 1990s he began ringing at sites on the River Aire, including a mining subsidence `flash' now called Beal Carrs which began to develop in late 1999 and became his main study area. By the time of his Presidency of the YNU in 2011 he had compiled 11 years of data for the site and a list of 175 bird species. He not only ringed at Beal Carrs but became its unofficial warden. His Presidential Address, *I only wanted to watch Birds,* reveals, through a series of amusing anecdotes, the amazing range of threats that such a site faces both from arable farming and from the local population and shows the need for constant vigilance and considerable inter-personal skills if the site is to be conserved. John possessed these attributes.

His inter-personal skills were also put to good use in training bird ringers. He was involved in the very successful programme of week-end courses run jointly by the BTO and the Field Studies Council at Flatford Mill in Suffolk. Nearer to home he introduced bird ringing into the YNU course in field skills provided for students on the University of Leeds MSc in Biological Conservation. He also provided ringing demonstrations at the annual Rutland Bird Fair and for one-off events such as Bioblitzes.

John became a trustee of the YNU in 2001, serving first as its Development Officer and subsequently as a member of the Education Committee and as Deputy Chair of the Executive. In that position he provided a steady hand and wise advice as the Union and its publications portfolio were re-structured for modern conditions. In the last decade he has also been the Bird Recorder for VC63, in which role he worked tirelessly promoting the cause of the centralised recording of data for the benefit of the County's avifauna.

His sudden serious illness in 2013 and his subsequent death came as a shock to his many friends. He will be greatly missed. Our sympathies go out to his wife Pauline.

John Bowers and **Mike Denton**

Obituary: Leslie Magee B.A., C.Eng., M.I.Mech.E., M.I.E.T. 1918-2013

Leslie Magee was born in Barnsley in 1918, two years before his brother Jack. His first fishing outing was when he was about eight and he very soon became a committed fisherman in a mining town where it was no more than twenty minutes walk in any direction to open country with still or running water. He fished in the rivers, streams, ornamental lakes and serpentines of the great estates that lay nearby to the south and west, the landscapes of Wentworth and Wharncliffe especially engraving themselves firmly within his memory, sceneries of his youth which he always spoke of in later life with great fondness; all this with no note of trespass for his father, in his younger days, had been employed by a local grandee.

He attended Bishop Holgate Grammar School and looked back on happy times there, his lifelong love of science, technology and the natural world encouraged and nurtured there, strengthened by his enquiring mind. He had been keeping a closely written nature diary from the age of ten and, when twelve years old, he was appointed secretary of the junior school rambling club, writing reports on egg-collecting, bird-watching, botanising and days spent fishing. During the interwar years of his adolescence he was learning the art of fly-tying, taking full advantage of every self-respecting gamekeeper having a gibbet hung with birds of prey and other 'vermin', the multi-coloured feathers needed for dressing a fly being freely available.

In his later teens an inborn leaning led him into the world of engineering and, when World War II broke out, he was engaged in vital war work at Vickers foundry, starting there as Fitter and Turner before very soon taking his Higher National Diploma. During the war years, he met Peggy, who became his wife in 1942. Their courtship was a time when, during their country walks, she intensified his interest in wild flowers and their names so that, with his keen observational skills and his prior knowledge of wild birds, his passion for natural history began to know no bounds.

Janet Lynne, their first daughter, was born in 1942 and her sister, Lesley Jane, in 1948. At this point Les moved to Crofts Engineers in Bradford, becoming in his leisure time a stalwart member of the Bradford Naturalists; this move was followed by one to Head Wrightson at Thornaby on Tees, where he inevitably joined the Middlesbrough Naturalists, with the botanical and entomological riches of Teeside nearby. Later, a further move, to Renolds in Bradford, found him once again living close by the River Wharfe, reinvigorating his interest in his earlier never quelled passion, angling. He explored the Wharfe's reaches and niches, learning its turns and twists and its countless denizens and moving into a fresh field of intensive study, the Ephemeroptera.

Fascinated by the Yorkshire fishermen who had gone before him, Les rekindled his angling

concerns, collecting a mass of text and illustration from a great variety of sources, including many rare and valuable antiquarian volumes, generously loaned by friends and others aware that he was planning a book on angling in Yorkshire. This culminated in his authorship of *Fly Fishing, the North Country Tradition*. This book, a mixture of anecdote, history and technical description, now recognised as a classic, was published by Smith Settle of Otley at £22, with a deluxe numbered edition of 50 copies, bound in goatskin, each containing 30 flies tied by Simon Ashworth and available on subscription at £325 for its two volumes. In the £22 version that Les was kind enough to give me he inscribed as epigraph a quotation from T. E. Pritt, the renowned Victorian angler: "One of the great charms of angling is that it generates an endless field for discussion, argument and experiment." These three fruits of angling seem to me to sum up much of Les' life and character as a natural historian, for he was a great talker with many years of memory to draw upon, and keen to enjoy with others the exchange of story and opinion. This profusion of knowledge and story served him well during his time as County Correspondent of the periodical *Trout and Salmon* and made him welcome on so many club, syndicate and private waters across Yorkshire and further afield.

Les' working life was by now that of a consultant chartered engineer, much in demand, taking him into Europe, Egypt, Thailand, South Korea and China, where he seized the opportunity of seeing different cultures at close quarters, making new friendships and encountering a new diversity of landscapes, complementing his experience of the British flora, fauna and habitats.

His first encounters with the YNU had been as a schoolboy through the affiliated membership of the Barnsley Naturalists but in 1956, at the invitation of George Shaw and A. Malins-Smith, he became a full member. With Douglas Richardson he set about the re-establishment of the YNU's Freshwater Biological Section, which still flourishes and was officially renamed the Freshwater Ecology Section in 2001, Les occupying the Section secretaryship for many years. He wrote regularly for *The Naturalist* and the *YNU Bulletin*: among his contributions were (as Botanical Recorder for VC64) the Mid-West Yorkshire Annual Botanical Reports for 1983-1994, numerous book reviews and Freshwater Section Excursion Reports. A particularly important paper in the society's journal in 1993 was 'A Review of the Grayling (*Thymallus thymallus* L.) in Yorkshire and some records of transfers of fish and ova.' In the same year Les was elected to the Presidency of the Union, a position he held to be among the highest honours the Society or the County could bestow and in which he took the greatest pride. The paper he gave as his Presidential Address, 'Yorkshire Mayflies', remains one of his major achievements, as readable and engaging today as at the time of its presentation.

Over the years Les was also twice President of the Bradford Naturalists' Society and of the Cleveland Naturalists' Club, and during the 1960s he was a founder member of the Darlington and Northumberland Field Trust. Throughout his long life he was polymath in nature and practice, so that his friends were unsurprised to find him in his later years adding to his interests in history, literature, French and Mandarin by studying successfully for a degree in Spanish!

Les is survived by his wife Peggy and their two daughters and by his grand, great-grand and great-great-grandchildren. His company and conversation will be sadly missed by all his naturalist friends and the angling community.

Albert Henderson

Field Note: Positive news of Floating Water-plantain in the Calder & Hebble Navigation

Ray Goulder email: r.goulder@hull.ac.uk

The gloomy conclusion of the YNU excursion held on 18 May 2013 was that Floating Water-plantain *Luronium natans* (scarce in Britain and with EU-wide protection) has died out from the canal at Cromwell Bottom because of an increase in boating (*The Naturalist* 138, p.223). It is good to report that this is overly pessimistic. On 12 June 2014 conditions were particularly favourable for observing underwater plants from the towing path; that is bright sunlight, little ripple and clear water. Along the canal from Brookfoot Lock (SE135228) westwards to Cromwell Lock and beyond towards Park Nook Lock (c.2.3km) much of the canal bed was seen to be occupied by up to 100% cover of the linear-leaved rosettes of submerged Floating Water-plantain in water depths varying from c.50cm to 1m. Furthermore, loose, free-floating, stolon-linked rosettes were observed at the water's edge, presumably dislodged by boats and/or geese. The oval floating leaves of the plant were, in contrast, very scarce and no flowers were seen.

Underwater rosettes of Floating Water-plantain grow closely against the canal bed and it is possible that they tend to escape mechanical damage by boats. Other submerged aquatic plants that have buoyant leafy shoots that grow upright in the water column are perhaps more vulnerable. Other submerged plants observed included water-starwort *Callitriche* sp., Nuttall's Waterweed *Elodea nuttallii*, Arrowhead *Sagittaria sagittifolia* (largely its submerged ribbon-like leaves) and Unbranched Bur-reed *Sparganium emersum*. Clearly in this canal there is co-existence between a plant community of conservation significance and boat traffic.

Field Note: Rough Niger - a first record for the North of England

Heather Walker New Zealand, Aberford, Leeds LS25 3DX

I first saw this plant growing in a crack in the concrete near my kitchen door in Aberford but by December 2013 it measured over 80cm high and about 50cm wide. The branches from a hollow central stem started to form clumps of green-petalled flowers about as big as a little fingernail.

I took a sample of the plant to the YNU AGM but nobody could identify it. I then sent a sample to the YNU Recorder for Alien Plants, Geoffrey Wilmore, who could not identify it either but sent it on to Eric Clements in Hampshire. He identified it as Rough Niger *Guizotia scabra*, a member of the dandelion family.

This appears to be the first record for the North of England and only the third for England. The two previous English records are from Hampshire and Kent in 2010 and 2011. The Aberford plant was very probably imported with the bird seed I feed to my canary. Its origin is uncertain, probably tropical or sub-tropical from Ethiopia or Abyssinia!

Sadly, during the gales in late December, the plant was snapped from the bottom and completely destroyed.

Yorkshire Naturalists' Union Excursions in 2014

Compiled by **Albert Henderson** and **Adrian Norris**

Forge Valley, Scarborough (VC62) 17 May 2014

INTRODUCTION (Adrian Norris)

The late delivery of *The Naturalist* with the meeting details may have affected the number of people at the Forge Valley meeting, although details were available on the YNU website. Only 12 members attended the event and fewer still the meeting at the village hall in Ayton. It was most unfortunate that Mike Carroll was unable to be with us as he had to attend a memorial service at the last minute. Nonetheless, the day was most successful with recorders of several major and minor groups having a very fruitful day. The weather proved to be very warm with unbroken sunshine throughout.

The indoor meeting held at the Parish Hall in East Ayton at 4pm proved just as productive, with a great deal of discussion on the various groups recorded and the environment of the areas visited. Those who did attend would like to thank Mrs Joy Tomlinson for her help and cooperation on the day.

COMMENTS ON THE ENVIRONMENT (Adrian Norris)

Several members commented that the woodland on the western bank of the River Derwent has been affected by the drainage of the steep slopes above the wooden footpath which snakes along the riverbank. A series of drains has been cut into the slopes allowing the water to be directed into channels, presumably so that work on the footpaths could take place more easily. The lower slopes are dominated by lime-rich tufa. The changes have also had a drastic effect on the woodland which was very rich in damp-loving plants such as Great Water Horsetail *Equisetum telmateia* and Great Pendulous Sedge *Carex pendula*, both of which appeared to be diminished. The woodland was dominated by Ramsons *Allium ursinum*, usually considered to be more abundant in drier woodland.

Discussion took place about the area of scrubby Gorse *Ulex europaea* situated to the north-west of the woodland at c.SE980875 below Spikers Hill. This has become overgrown over the years and, although it is very good for spiders and small birds, it is far less diverse in other groups of animals and plants. The area further to the north-west includes two deep channels cutting down through the whole area at SE980876 and SE979876, draining the many original spring lines and changing the environment considerably, with the loss of the very rich springs that used to occur here.

Several footpaths are in need of repair, mainly due to broken slats which could be dangerous. In the long term it might be better to replace the wooden decking by one made of recycled plastics.

It was also noted that several trees appeared to have developed Ash Dieback *Hymenoscyphus pseudoalbidus*, a problem requiring careful monitoring.

LEPIDOPTERA (Terry Crawford)
Many butterflies were active in the warm conditions. The majority were Orange-tip and Green-veined White, although a further seven species were noted as singletons or in very small numbers: Large White, Small White, Brimstone, Red Admiral, Peacock, Small Tortoiseshell and Comma. Surprisingly, no Speckled Wood was reported. Three geometrid moths were seen, a Common Carpet, a Silver-ground Carpet and a Common Marbled Carpet.

PARASITIC HYMENOPTERA (Bill Ely)
I stopped at four car parks and spent an hour collecting specimens at each, two on the banks of the Derwent in Ruston Cliff Wood and two away from the river in Raincliffe Woods. I collected 19 species of ichneumons and 4 proctotrupoids that I could identify. The most exciting proctotrupoid was a male *Acropiesta* which does not accord with the description of any species known from Europe. It seems to be undescribed. No ichneumon was found in all four samples but one was in three of them and three were in two samples. Ten were represented by singletons. Ten ichneumons were new to SE98 and raised its total to 102, making this the nineteenth Yorkshire hectad to reach the 100-species mark. Two of the Ruston Cliff Wood specimens were new to VC62: the tenth Yorkshire record (8th site) of the cryptine *Atractodes (Atractodes) obsoletor* and the fourth Yorkshire record of the orthocentrine *Aperileptus infuscatus*. The campoplegine *Campoletis ensator* from Raincliffe Woods was also new to VC62 and the fifth confirmed Yorkshire record. The orthocentrine *Orthocentrus spurius* was the third Yorkshire record. To summarise, this visit in early summer recorded one fifth of the ichneumons known from this area (increasing the total by 10% in the process) and just 2% of the Yorkshire fauna with half the species represented by single specimens. I consider this to be a successful result but I suspect that most other recorders would regard these as very thin pickings.

MOLLUSCS (Adrian Norris)
Four members and friends, including our President-Elect, surveyed the woodland bordering the River Derwent close to the junction of the main valley and Lady Edith's Drive within SE9887. A total of 46 molluscs was noted, including several rare or very local in Yorkshire. The more interesting snails included Point Snail *Acicula fusca,* Round-mouthed Snail *Pomatias elegans,* Toothless Chrysalis Snail *Columella edentula, C. aspera,* English Chrysalis Snail *Leiostyla anglica,* Plated Snail *Spermodea lamellata* and Brown Snail *Zenobiella subrufescens*. There was a single specimen of Ash-black Slug *Limax cinereoniger.* The best record, however, was Hollowed Glass Snail *Zonitoides excavatus,* first located by Geoff Oxford at SE98448753 in acid woodland on the lower side of Lady Edith's Drive. This is a stretch of fairly dry acid woodland in an area dominated by very wet limestone/neutral woodland, at least close to the river. The only record of this snail from Forge Valley dates back to the late E. Arnold Wallis who found it at Spikers Hill prior to 1954. I have searched for it in the area over many years and was delighted with this find.

Thorpe Marsh YWT Nature Reserve (VC63) 14 June 2014

INTRODUCTION (Joyce Simmons)
By ill luck, the highways authority chose June to close the usual entrance road to the YWT Thorpe Marsh Nature Reserve, so hasty information was posted as to an alternative route. Thankfully, 22 members of 10 affiliated societies found the new entrance.

The Reserve has varied habitats with dry, now disused, railway embankments, one with numerous mature oaks; relatively young woodland; unimproved and semi-improved meadows; some small water bodies and the main mere. The day was cloudy and warm with a lunchtime shower and some drizzle. Previous rain had led to luxuriant growth and to some areas being very wet underfoot. The damp conditions kept Lepidoptera numbers low but other insects were abundant, with the Coleoptera find of the day being the Alder Leaf Beetle *Agelastica alni,* which has spread northwards. A young Common Newt was found as people were arriving (see Plate VI, centre pages) and mammals were in short supply; just singles of Fox *Vulpes vulpes*, Rabbit *Oryctolagus cuniculus* and Grey Squirrel *Sciurus carolinensis*. Botanical findings included interesting sedges and some orchids. Colin Wall found 40 mosses, though none were rare.

It was felt that the Reserve would benefit from some management of trees. There is encroachment of the Reed-bed by willows which will rapidly shade them out. For much of its length the railway embankment is well shaded with abundant growth of Stinging Nettle *Urtica dioica*. Some of the trees, particularly those on south-facing slopes of the many old railway embankments, could be removed to allow more light to reach the ground for the benefit of delicate plants and associated insects. The wetland habitats are the primary interest of the Reserve, but clearing some of the trees would encourage the establishment of drier habitats which would help increase the total biodiversity of the site.

I am grateful for the help given to me by Mick Townsend and his very small team of Thorpe Marsh volunteers in arranging this meeting, dealing with the difficulties following the closure of the road and making the visit enjoyable for everyone who attended.

FLOWERING PLANTS (Louise Hill)
Our route took us from the old visitor centre location westwards along the old railway embankment up to the main East Coast Railway Line. The majority is now heavily shaded and dominated by birch woodland with Stinging Nettle and bramble, including *Rubus eboracensis*. Some interesting clinker communities survive on the unshaded section at the farthest end. Notable plants included Squirreltail Fescue *Vulpia bromoides,* Common Cudweed *Filago vulgaris,* Fairy Flax *Linum catharticum,* Thyme-leaved Speedwell *Veronica serpyllifolia,* Mouse-ear-hawkweed *Pilosella officinarum,* Thyme-leaved Sandwort *Arenaria serpyllifolia,* Common Stork's-bill *Erodium cicutarium,* Common Centaury *Centaurium erythraea* and a moss-like carpet

of Rabbit-nibbled Lady's Bedstraw *Galium verum*.

An area of partially inundated rush pasture and marsh in the south-west corner of Reedholme, near the Cockshaw Drain, included a suite of rushes together with Common Spotted-orchid *Dactylorhiza fuchsii,* Great Burnet *Sanguisorba officinalis,* Greater Bird's-foot-trefoil *Lotus pedunculatus,* Hairy Sedge *Carex hirta* and Cuckooflower *Cardamine pratensis.* A detour along the very wet southern edge of Reedholme crossed numerous flooded furrows in the grassland where a number of sedges were encountered: Oval Sedge *Carex ovalis,* Greater Pond-sedge *C. riparia* and False Fox-sedge *C. otrubae.* The sward of the adjacent pasture included locally frequent Common Spotted-orchid, Field Wood-rush *Luzula campestris* and Quaking-grass *Briza media.*

Two recently-established waterbodies, Louis' pond and Applehurst Flash, support a range of aquatic and emergent plants including Grey Club-rush *Schoenoplectus tabernaemontani*, Water-purslane *Lythrum portula,* Marsh Yellow-cress *Rorippa palustris,* Common Water-crowfoot *Ranunculus aquatilis* and Pink Water-speedwell *Veronica catenata.* The much older and larger waterbody Applehurst Pond contains a number of tall emergents including the less common Lesser Bulrush *Typha angustifolia* and Cyperus Sedge *Carex pseudocyperus,* together with an abundance of Skullcap *Scutellaria galericulata*. Several plants of what is believed to be Fine-leaved Water-dropwort *Oenanthe aquatica* were also seen. This plant is known to occur within the Thorpe Marsh area but the deep mud at the margin of the pond prevented access to confirm this identification.

Returning to the main entrance track (by way of a padlocked, and high, field gate!) to an area of tall fen near the old pond-dipping platform near Sicklecroft, the group encountered Spiked Sedge *Carex spicata, C.* x *sooi (= Carex acutiformis x riparia),* Hairy Dog-rose *Rosa caesia* and Common Fleabane *Pulicaria dysenterica*. Taking the main track back to the starting point we passed several spikes of Broad-leaved Helleborine *Epipactis helleborine* and a low scrub layer of Dewberry *Rubus caesius*. A short diversion in front of the Mere Scrape Hide was made, resulting in the discovery of a new colony of Brown Sedge *Carex disticha*. Lesser Hawkbit *Leontodon saxatilis* was also found on the margins of the adjacent Mere.

A final wander south through Cockshaw Fields took in Devil's-bit Scabious *Succisa pratensis,* Great Burnet and Trailing Tormentil *Potentilla anglica* within the species-rich meadow and our final foray into the sedge-choked oxbow of the old Ea Beck found further colonies of both Grey Club-rush and Spiked Sedge.

PLANT GALLS (Tom Higginbottom)

The uncommon bud galls on oak caused by gall wasps were highlights of the day. The slight curve and reddish hairs, a feature of *Andricus solitarius,* was one of the first discoveries and *A. callidoma*, with its longish stalk and flattened surfaces, was another good find. The Ramshorn Gall *A. aries*, a more recent arrival in Yorkshire, was found on the epicormic shoots. The botanists passed on a swollen stem of Rosebay Willowherb *Chamerion angustifolium* which indicated the presence of the micro-moth galler *Mompha sturnipennella* while the midge galler *Dasineura spadicea* had thickened the pods of Tufted Vetch *Vicia cracca*. *Gymnosporangium clavariiforme*, which forms a dramatic fungal gall on the underside of a Hawthorn *Crataegus*

monogyna leaf or on the petiole, was also discovered. The anthers of White Campion *Silene latifolia* had been attacked by the fungus *Microbotryum lychnidis-dioicae* so that many of the petals were covered in the purple smut.

LEPIDOPTERA (Paul Simmons, Ken Woolley, Terry Crawford, Peter Tannett)
Due to torrential rain the previous evening it was not possible for David Chesmore to moth-trap. The cool and cloudy conditions on the day were not conducive to finding many butterflies or moths but, as several recorders were present, 8 butterflies and 19 moths were seen. Meadow Brown was the most numerous followed by Large Skipper, reflecting the large meadow areas. An early Ringlet was perhaps the most surprising of the butterflies. The commonest macro-moth was the attractive Blood-vein *Timandra comae*, and one perfect specimen was the subject of many photographs (see Plate VI, cenrte pages). Others of note were Barred Yellow *Cidaria fulvata*, a local moth with few recent records in the area, and Clouded Border *Lomaspilis marginata*, a woodland moth whose caterpillars feed on sallow which is plentiful in the reserve. Of the micros, The Yellow-barred Long-horn *Nemophora degeerella* is always an interesting find and the most colourful micro was the Green Oak Tortrix *Tortrix viridana*. The leaf-mines of *Cameraria ohridella* were noted on Horse-Chestnut *Aesculus hippocastanum*. A visit about a month later confirmed the presence of Purple Hairstreaks on the oaks on the old railway embankment.

COLEOPTERA (Bob Marsh)
A fairly wide variety of habitats was investigated and, generally speaking, the day produced a wide range of fairly common and widespread beetles. Cow dung was examined in Reedholme and several species of *Cercyon* were identified, along with *Sphaeridium lunatum* and the aleocharine *Aleochara intricata*, widely but thinly distributed in Yorkshire with about 20 county records. The Reed-beds around the Mere produced large numbers of the melyrid *Anthocomus rufus* in one small location and at quite an early date in the year for it. Once quite scarce, this beetle has increased in range in VC63 and now may be found more often in beds of Common Reed *Phragmites australis* and Bulrush *Typha latifolia* where water quality is good. The beating of Hawthorn foliage on the Main Embankment produced *Malthinus seriepunctatus*, a rather local and infrequent soldier beetle with only 20 county records. The wetland below the Main Embankment hide overlooking the Mere produced the Alder Leaf Beetle *Agelastica alni*, and Mike Denton reported gravid females and pairs in cop on Alder *Alnus glutinosa*. This beetle was considered a great rarity in Britain, occurring in only half dozen sites in the far south of England, until its discovery on the western side of the Pennines in 2004. It has now spread to South Yorkshire and has occurred in many sites in VC63, mainly in its southern half, over the last two or three years. Its appearance in the north of England and its subsequent rapid spread is unexplained. In all, the day produced 94 beetles. A surprising consequence of our day's work is that 29 of these (i.e. 30%), all common and widespread, were new to the Reserve, which indicates that there is still much work to be done on this interesting and varied site.

ODONATA (Peter Tannett)
Apart from good numbers of Ruddy Darter *Sympetrum sanguineum* and several Common Blue Damselfly *Enallagma cyathigerum* and Blue-tailed Damselfly *Ischnura elegans,* only singles of Southern Hawker *Aeshna cyanea,* Brown Hawker *A. grandis* and Common Darter *S. striolatum* were seen. The torrential rain of the previous days would have limited numbers.

MOLLUSCS (Adrian Norris)

Terry Crawford and I recorded some 20 species of molluscs from 3 ten-kilometre squares, the main areas studied being SE5709, SE5809 and SE5909. The most notable was a single specimen of *Lymnaea* (*Stagnicola*) *fusca* located in a drainage ditch in SE5809. This is a fairly recent split from *L. (S.) palustris,* which now appears to be rather rare in the county, so is a recent addition to the Yorkshire list and we are still trying to work out its distribution. Sowerby's Keeled Slug *Tandonia sowerbyi* is mainly a pest of root crops and thus more commonly found in areas of intense agricultural activity, particularly among crops such as potatoes and carrots, but proved to be very common near one of the hides at SE590091. A total of 35 records made a substantial addition to our knowledge.

BIRDS (Paul Simmons)

A fly-by Cuckoo welcomed us all to the Reserve during the introductory session and proved to be the most unusual bird of the day, given its catastrophic decline in recent years. The wide range of habitats meant that a reasonable range of species was seen or heard, with woodland birds dominating. The four common warblers (Willow Warbler, Chiffchaff, Blackcap and Whitethroat) were all encountered though, as expected, tits were harder to find at this time of year. Of the birds dependent on the water bodies in the Reserve, Kingfisher and Curlew were the most notable sightings, both probably breeding on it or nearby. Buzzard and Kestrel were seen overhead. In all, 34 birds were found on the day.

Austwick & Lawkland Moss SSSI (VC64) 12 July 2014

INTRODUCTION (Terry Whitaker)

The Yorkshire Moths Group trapped on Austwick Moss on the Friday night, an act with reduced players consisting of the Divisional Secretary and Charlie Fletcher, ably assisted by David Fisher, John Perry, Paul and Joyce Simmons and Sharon and Peter Flint, who helped with the logistics of getting the trapping equipment onto this large and difficult site. Seven Robinson traps with MV lamps powered by three generators were set up, two in the eastern area, three centrally and two near the western boundary, in two separate 1km squares. The traps were supposed to run all night but the central generator failed and moths were only caught in five traps.

On Saturday at 07:30 the lepidopterists began emptying the moth traps just as the sun was getting hot. At 10.30 other people started to arrive and Judith Allinson lead a general natural history walk around the Moss. Eventually 31 people attended, including nine from Craven Conservation Group (CCG). Later in the day several people, mainly botanists, went east along the footpath to Lawkland Moss.

Helen Sergeant reported: “Terry Whitaker, John Perry and David Fisher ferried moth traps through the wet birch woods and returned with a couple of fungi. One was the Yellow Swamp

Russula *Russula claroflava*. It is supposedly good to eat (said to taste mild but a bit hot). TMW took it away to show to the reporting meeting so I didn't get chance to eat it. Later on we looked at the separately designated piece of calcareous flushed grassland to the north. Nearby were Sharon and Peter Flint and Stuart Ralph in the deep ditch surrounding the Moss. The conchologists also found this a much better location."

The reports meeting with tea and biscuits at the Dalesbridge Centre was attended by 15 members from 12 affiliated societies.

LANDSCAPE & VEGETATION (Terry Whitaker)
Austwick Moss consists of a cut-over lowland raised bog situated near the head waters of the River Wenning. It is bounded by Fen Beck, which was deepened by the local Internal Drainage Boards in the late 1960s to the great detriment of the wetland habitats of the area. To the east of Middlesber Farm and its mainly in-bye improved pasture, the land is slightly higher and consequently the smaller Lawkland Moss is drier, less acidic and more wooded with wet birch and willow woodland and small fen meadows.

The central area of Austwick Moss is a mosaic of bog and wet heath habitats (NVC M18 *Erica tetralix - Sphagnum papillosum* raised and blanket mire and M19 *Calluna vulgaris - Eriophorum vaginatum* blanket mire) with some planted Scots Pine *Pinus sylvestris* (dating from the late 1960s) and scattered colonising Downy Birch *Betula pubescens* and scrub willow. Old peat cuttings here are linked by several drier causeways, possibly laid on brush-wood foundations. The drainage cuts have caused the ombrogenous mire to dry out and wet birch woodland (W2 *Salix cinerea - Betula pubescens - Phragmites australis* woodland), of very limited extent in the 1940s, has spread to cover at least 5ha on the northern boundary. There are still extensive areas of Bog Myrtle *Myrica gale* scrub towards the north-western boundary but much of the species-rich fen meadows (M26) near the western boundary, which were present in the late 1990s, have dried out and mainly become the less speciose U2 *Deschampsia flexuosa* grassland. This grassland is extensive on the eastern part of Austwick Moss, replacing many areas which were originally M25 *Molinia caerulea – Potentilla erecta* mire. To the north and west of Austwick Moss is a grassy area of calcareous flush vegetation containing Blunt-flowered Rush *Juncus subnodulosus*, Black Bog-rush *Schoenus nigricans* and Birds-eye Primrose *Primula farinosa*.

FLOWERING PLANTS & FERNS (Phyl Abbott & Don Grant)
Austwick Moss was rather species-poor, being dominated by tufts of Purple Moor Grass *Molinia caerulea* with damper areas of bog-mosses in between. The highlights here were a few patches of Cranberry *Vaccinium oxycoccus* and a pretty, flowering Round-leaved Sundew *Drosera rotundifolia*. There were also several plants of *Rubus scissus*.

Lawkland Moss was more diverse with areas of woodland as well as damp grassland. We were pleased to see Dyer's Greenweed *Genista tinctoria*, Slender St John's-wort *Hypericum pulchrum*, Blunt-flowered Rush, Bogbean *Menyanthes trifoliata*, Marsh Cinquefoil *Comarum palustre*, Bay Willow *Salix pentandra* and Saw-wort *Serratula tinctoria* accompanied by the bedraggled leaves of Autumn Crocus *Colchicum autumnale* - a promise of better things to come. We were unable to find Coralroot Orchid *Corallorhiza trifida* or Adder's Tongue *Ophioglossum vulgatum* which had been seen during a YNU meeting in May 1984.

Thanks go to the organisers, Terry Whitaker and Judith Allinson (CCG), to the landowner Mr Anthony Fields and to Mr David Wilson of the adjacent Middlesber Farm for allowing access to their land.

BUTTERFLIES (Terry Whitaker)
Eight species of common butterflies were seen in the two 1km squares SD7566 and SD7666: Small Skipper (freshly emerged), Large Skipper (rare, worn), Green-veined White (second brood, freshly emerged and mating), Small Tortoiseshell (several freshly emerged seen in fields around the Moss), Peacock (larvae locally abundant, 'thousands' on nettles by Fen Beck) and the Small Pearl-bordered Fritillary (seen only on Lawkland Moss, three, very worn), Ringlet (very worn) and Meadow Brown.

NB No Small Pearl-bordered Fritillary was seen in SD7566, although this western area was an important location until 1999, and three or four were reported at SD761663 by SR earlier in season.

MOTHS (Charles Fletcher)
The night was fairly warm and when the traps were opened on the Saturday morning 109 moths were recorded. The most notable macro moth was the insignificant-looking Marsh Oblique-barred *Hypenodes humidalis* at its only Yorkshire site apart from some old records at Malham Tarn. Many of them had been seen flying at dusk on the Friday night. Good numbers of Fen Square-spot *Diarsia florida* were in the traps – an uncommon moth in the process of evolutionary separation from Small Square-spot *Diarsia rubi*. Other notable macros were Blackneck *Lygephila pastinum*, Bordered Beauty *Epione repandaria* and Minor Shoulder-knot *Brachylomia viminalis*. Micro moths included two Nationally Scarce B species – Mountain Groundling *Bryotropha boreella* and Mint Bent-wing *Pseudopostega crepusculella* along with other rarely-recorded ones such as Jointed-rush Case-bearer *Coleophora tamesis,* White Sallow Case-bearer *C. albidella* and Sallow Flat-body *Agonopterix conterminella*. Several more species were added to the list flying by day on the Saturday with the most notable being Wood Tiger *Parasemia plantaginis*, Cinquefoil Twist *Philedone gerningana* and Bilberry Tortrix *Aphelia viburnana*.

There was no sign of Silvery Arches *Polia trimaculosa,* found at this site in 2011, but it was felt that the site would repay further trapping at different times of year as other scarce moths may well be present.

PARASITIC HYMENOPTERA (Bill Ely)
All twelve ichneumons collected at Austwick Moss are new to the site although *Ichneumon extensorius*, collected by TMW at the western edge and by WAE at the north-east corner, was reported from 'Austwick' by W.J. Fordham in 1920. There were no previous ichneumon records from Lawkland Moss so all ten collected from the rushy meadow south of the woodland on this meeting are new site records. Only one, the ichneumonine *Centeterus rubiginosus*, was collected on both Austwick and Lawkland Mosses, a single male in each sample.

The ichneumonine *Tricholabus strigatorius* from Lawkland Moss is new to Yorkshire. Three ichneumons are new to VC64 including the pimpline *Polysphincta vexator*, which Roy Crossley

has found in the North York Moors and the Plain of York in recent years; this was also found from Lawkland Moss and is the fourth Yorkshire record. This ichneumon only occurs in rich wetlands where it parasitises the bright green orb-web spider *Araneus quadratus*, which is not restricted to this habitat! The tryphonine *Cosmoconus ceratophorus* from Austwick Moss has a dozen previous records in Yorkshire and parasitises sawfly larvae. The cryptine *Gambrus bipunctatus* from Lawkland Moss is the second Yorkshire record, having been added to the list on the 2013 Excursion to Fylingdales. This genus parasitises moth and sawfly larvae.

Three other ichneumons, all from Lawkland Moss, are rare in Yorkshire. The wingless cryptine *Gelis discedens* is the fourth record, the previous VC64 one being from the YNU visit to Austwick Moss in May 1987. The tryphonine *Erromenus zonarius* is the fifth record, previously found at Malham Tarn Fen on the YNU visit in July 1984. The ichneumonine *Ichneumon molitorius* is the sixth record (fourth confirmed) and the first from the Pennines. The diapriid *Basalys fumipennis* also from Lawkland Moss is a fairly common proctotrupoid in Yorkshire but has never been reported from the Pennines before.

MOLLUSCS (David Lindley)

The acid environment of Austwick and Lawkland Moss SSSI sites is not conducive to finding large numbers of molluscs. Because of this it was decided to concentrate on the periphery of Austwick Moss and in particular to look at the limestone walls and those areas of marsh with a more neutral pH.

In total 33 molluscs were found during the day. Freshwater snails White-lipped Ramshorn *Anisus leucostoma* and Margined Ramshorn *Planorbis planorbis* were in the streams on the north and west sides of the wood in small numbers and also in some of the ponds within the wood itself. Margined Ramshorn is rare in this area of the Dales due to lack of suitable habitat. In the small streams at the wood boundary were very large numbers of Jenkins' Spire Snail *Potamapyrgus antipodarum*. The terrestrial *Balea heydeni* was found in small numbers on the periphery wall on the north side together with Rock Snail *Pyramidula pusilla* and both were also seen on one of the track walls when approaching the site.

A small area of fen on the north-western edge was the most productive area and it was satisfying to find both Striated Whorl Snail *Vertigo substriata* and Marsh Whorl Snail *V. antivertigo* in this area. Both of these marsh-loving snails have been lost at a number of locations in recent years due to land drainage. Marsh Whorl Snail is not particularly common in the Yorkshire Dales.

FRESHWATER BIOLOGY (Sharon & Peter Flint)

We arrived fairly early in the morning in order to check on the caddis flies which had been attracted overnight to the light traps set by the lepidopterists. Several were in the traps including *Athripsodes albifrons* and *A. bilineatus* whose larvae live in the surrounding streams. One of the nicest non-lepidopteran finds in the light traps, however, was the Glow-worm *Lampyris noctiluca*, of which two adult males were found in separate traps.

We moved on to investigate some of the ponds, remnants of old peat workings, which are scattered over the area. Some are peaty with bog-mosses, though only just on the mildly acidic

side of neutral while others, particularly those in the north western area of wet woodland, are somewhat calcareous. We also investigated the small calcareous stream which forms the northern and western boundaries of the Moss. In many of the bog-moss-dominated ponds were large numbers of Water Spider *Argyroneta aquatica*. Several dytiscid water beetles were found, including the large and spectacular *Dytiscus marginalis* and *D. semisulcatus*; in one of the ponds we took both these species together with the slightly smaller, saucer-shaped *Acilius sulcatus*. Several species of lesser water-boatmen and all three freshwater species of water boatmen occur on the moss, and in one pond we found all three (*Notonecta glauca, N. obliqua* and *N. maculata*) together. Several specimens of the small Emerald Damselfly *Lestes sponsa*, which breeds in the peaty ponds, were seen flying, and juveniles of the Large Red Damselfly *Pyrrhosoma nymphula* and the Common Hawker dragonfly *Aeshna juncea* were found in these ponds. Larvae of the large phryganeid caddisfly *Oligotricha striata* were also found. The crustaceans *Gammarus pulex* and *Asellus aquaticus* are abundant in the stream, the latter occurring, together with *Crangonyx pseudogracilis*, in the calcareous ponds. We found no crustaceans in the peaty ponds.

Altogether it was a successful day in an interesting habitat.

BIRDS (Stuart Ralph)
Sedge Warbler, Reed Bunting, Spotted Flycatcher (nesting), Willow Warbler, Grasshopper Warbler, Lesser Whitethroat, Long-tailed Tit, Great Spotted Woodpecker, Woodcock, Curlew, Kestrel and Common Buzzard have recently been seen on the site.

MAMMALS AND OTHER VERTEBRATES (Terry Whitaker)
Noted during the meeting at SD7566 on the western side of Austwick Moss were Stoat *Mustela erminea*, Palmate Newt *Lissotriton helveticus*, a small Frog *Rana temporaria*, a Toad *Bufo bufo* and a Viviparous Lizard *Zootoca vivipara*; at SD7666 on the Moss were a Palmate Newt, two Common Frogs and one Brown Hare *Lepus europaeus*; and in the stream on the north side were Bullhead *Cottus gobio* and Three-spined Stickleback *Gasterosteus aculeatus*. Viviparous Lizard was also seen on Lawkland Moss. Stuart Ralph said that Roe Deer *Capreolus capreolus*, Badger *Meles meles* and Red Fox were regularly seen on the Moss.

Swaledale, Grinton, Harkerside Moor (VC65) 26 July 2014

INTRODUCTION (John Newbould)
Just five members turned up at Grinton Church for the reports meeting. Five other members of the Yorkshire Lepidoptera Group had moth-trapped overnight in the National Trust's Hudswell Wood, Richmond (NZ157008). This represented just eight affiliated societies but fortunately did not lessen the amount of recording undertaken at the meeting. In addition to Charlie Fletcher's group, Terry Whitaker moth-trapped at Low Whitta near the Juniper woodland (SE012983) whilst JAN moth-trapped at Fremington on 25 and 26 July with some of the best results he has

had from four years here. In addition, JAN ran a bat detector adjacent to Arkle Beck by Reeth Bridge on the evening of the 25th.

Following a hot day in the field, the small party held the tea meeting at the Bridge Inn, Grinton.

LANDSCAPE (John Newbould)

The day was spent surveying land to the south west of Grinton and the River Swale including the following broad habitat types: rivers and streams; boundary and linear features; neutral grassland – lowland meadows; dwarf shrub heath (upland heath); and fen, marsh and swamp (Purple Moor-grass and rush pasture). We also surveyed a small part of the Lovely Seat and Stainton Moor SSSI, which includes Maiden Castle, a hillfort considered to have been constructed as a defensive settlement in the mid-prehistoric period (7th -5th centuries BC).

TMW, Judith Allinson and Bill Ely surveyed in the co-axial meadows south of the River Swale from Grinton to Reeth (see Fig.1), and in the afternoon went to Cogden Gill, whilst Richard Wilson and JAN surveyed the moorland fringes of Harkerside Moor south of Swale Hall Lane with its many relic lead mines, wet flushes and heather moorland. Here we were looking over Healaugh to the north, where meadows are again co-axial below Reeth Low Moor. Nearly all the hay meadows had been cut by early July leaving little to survey. One key feature of these lowland Dales meadows is the drystone walls, with many fields having Ash *Fraxinus excelsior* trees, especially adjacent to the villages. In the Grinton area, the Swale itself is lined mainly with Ash, but also Alder and various sallows. TMW followed the footpath on the south side of the River Swale to Reeth. Near SE037936 he encountered several very large (ancient?) Sycamore trees *Acer pseodoplatanus*, some with girths at breast height in excess of 2m. The river water was so warm that many people were finding deep pools to swim in.

Figure 1. The upper Swale valley showing co-axial fields with traditional stone walls and ash trees growing adjacent. *John Newbould*

FLOWERING PLANTS (John Newbould and Terry Whitaker)

Following our inspection of the Juniper woodland *Juniperus communis* at Low Whita in 2013, JAN arranged to look at the area from the road whilst TMW ran moth traps nearby. With the reported *Phytopthora* infection we expected many dead plants but we both considered the amount of dead branches similar to that in our 2013 visit. The only slight difference we noted was that patches of terminal needles had turned brown in a very few areas, but this is following a dry spring and summer. Several female plants were bearing young fruit.

Unlike JAN's local Dorset heaths, the moors surrounding the ancient earthwork at Maiden Castle are not rich pickings for botanists with NVC H1 *Calluna vulgaris–Festuca ovina,* H9 *Calluna vulgaris–Deschamsia flexuosa* together with Heath Bedstraw *Galium saxatile* and H18 *Vaccinium myrtillus-Deschampsia flexuosa* communities. Mat-grass *Nardus stricta* was present with Tormentil *Potentilla erecta* forming patches of U5 Grassland. Wet flushes had a range of rushes and Lesser Spearwort *Ranunculus flammula*. Burnt areas had the moss *Ditrichum heteromallum* whilst an acid grassland area had abundant *Rhytidiadelphus squarrosus. Sphagnum cuspidatum* was present in most wet flushes. Maiden Castle has Heather *Calluna vulgaris* on its ramparts whilst the flat area has Bracken *Pteridium aquilinum*, Bilberry *Vaccinium myrtillus* and Heather.

Note: A Himalayan Balsam-dock-Ragwort ruderal community (Terry Whitaker)

An interesting ruderal community was encountered on river shingle by the River Swale near Reeth. Since 2008 the river has cut off a large oxbow, scoured away any soil and vegetation and deposited a large (c.1ha) coarse shingle bank which forms an occasionally isolated island at SE033988. The vegetation that has developed is dominated by just five plants: Himalayan Balsam *Impatiens glandulifera*, Curled Dock *Rumex crispus* and Broad-leaved Dock *R. obtusifolius*, Common Ragwort *Senecio jacobaea* and Colt's-foot *Tussilago farfara*, but is remarkably speciose. All of the other 46 plants encountered occur at less than 1% frequency. I consider it not really valid to try to designate a rigorous NVC type of definition to a ruderal community (as per Rodwell) because they are usually early seral stages or short-lived communities and depend for establishment almost entirely on local colonisation opportunities rather than being semi-stable closed communities where interspecific competition is taking place. However, many people have been trying to do it. It may be that we are seeing the development of semi-stable *Impatiens*-dominated communities alongside our rivers accompanied by common native ruderal weeds.

LICHENS (John Newbould)

Bare peat under the heath here and there was liberally colonised by *Parmelia saxatilis* and *Cladonia portentosa*. On the western rampart of Maiden Castle was a single veteran Hawthorn with a trunk of 0.4m diameter. On its northern side was a moribund branch totally covered in *Hypogymnia physodes, H. tubulosa, Lecanora conizaeoides, Melanelixia subaurifera, Ochrolechia androgyna, Parmelia sulcata, Physcia tenella, Ramalina farinacea* and *R. fastigiata.*

LEPIDOPTERA (Charles Fletcher, Terry Whitaker and John Newbould)

Although nearing the end of the season the good weather enabled ten butterflies to be seen. JAN and his wife walked the Round Howe meadows at Hudswell Woods on 25 July recording eight species of butterflies including Large Skipper *Ochlodes venata,* Small Skipper *Thymelicus sylvestris* and Small Heath *Coenonympha pamphilus.* We noted just two end-of-season Chimney

Sweeper *Odezia atrata* moths. A single Dark-green Fritillary *Argynnis aglaja* flew past at speed on the western rampart of Maiden Castle where a day-flying Burnished Brass *Diachrysia chrysitis* was also seen. A Striped Twin-spot Carpet *Nebula salicata* was spotted in Cogden Gill.

CHF provided a list of 122 moths trapped at Round Howe (NZ157008) using five MV traps overnight on 25-26 July, commenting that he felt to be only scratching the surface. The most important ones included: Square-spotted Clay *Xestia rhomboidea* (Nationally Scarce B) (i.e. found in 30 - 100 x 10K squares in GB since 1980 and formerly a UK BAP species) occurring typically in old woodland in the north and north-west of the county, its larvae feeding on a wide variety of herbs including Stinging Nettle and Primrose *Primula vulgaris*; Plain Clay *Eugnorisma depuncta* (Nationally Scarce B) at the edge of its limited range in Yorkshire, its larvae feeding on a wide variety of herbs including Stinging Nettle, Primrose and stitchworts; Northern Tubic *Denisia similella* (provisional Nationally Scarce B), a northern moth whose larvae feed on fungi under bark; Speckled Case-bearer *Coleophora sternipennella* (provisional Nationally Scarce B) feeds on oraches and goosefoots; and a further eleven classed as local (100-300 x 10km squares since 1980), including Sorrel Bent-wing *Opostega salaciella*, Two-spotted Neb *Eulamprotes atrella*, Plum Fruit Moth *Grapholita funebrana*, Coronet *Craniophora ligustri*, Buff Footman *Eilema lurideola* and Lempke's Gold Spot *Plusia putnami*. NB: Coronet is an important species of upland ash woodland in the county and should be monitored in view of Ash Dieback disease.
At Low Barn, Fremington an actinic trap collected 17 moths on 25-26 July and 29 on 26-27 July despite heavy rain in the early hours of the 27th, including Tawny Speckled Pug *Eupithecia icterata* and Scalloped Oak *Crocallis elinguaria*.

TMW, in full biosecure mode, moth-trapped overnight on 25-26 July near the Juniper. He used two Robinson Traps with MV bulbs and an 8w actinic Heath trap; 742 specimens of 77 species were caught. The only significant one was Chestnut-coloured Carpet *Thera cognata* (Nationally Scarce B), the first confirmed record and the only VC65 record since 1880. The local upland moths Scarce Silver Y *Syngrapha interrogationis* and Light Knot Grass *Acronicta menyanthidis* were also seen. Juniper Pug *Eupithecia pusillata* was caught in numbers (56 specimens). It is usually recorded in relatively small numbers associated with domesticated Juniper *Juniperus chinensis*.

PARASITIC HYMENOPTERA (Bill Ely)
The euphorine braconid *Pygostolus sticticus,* which TMW trapped at light at Low Whita, the campoplegine ichneumon *Casinaria ischnogaster,* the metopiine *Chorinaeus brevicalcar* and the diplazontine *Diplazon varicoxa,* all from Grinton Church, were all new to VC65.

The ophionine ichneumon *Ophion pteridis,* also trapped by TMW at light at Low Whita, the diplazontine *Sussaba pulchella* from the fields west of Grinton, the banchine *Lissonota gracilenta* and the ichneumonine *Centeterus confector* (both fifth Yorkshire records) from Cogden Gill were all new to Swaledale, while the only previous Swaledale record of *Lissonota clypeator,* found in the fields west of Grinton, was east of Northallerton in VC62.

PLANT GALLS (John Newbould)
In the Grinton-Fremington-Reeth area the squares SE0498 and SE0499 are two of the best recorded in Swaledale and this meeting added little. The terrain on Harker Moor is not

particularly good for plant galls but it was pleasing to see the rarely recorded *Trisetacus quadrisetus* still present on the fruits on female Juniper at Low Whitta. The weevil gall *Apion rubens* is worth searching for on the small leaves of Sheep's Sorrel *Rumex acetosa*. I also risked pricking my fingers for the larvae of *Tephritis conura* in the flower heads of Marsh Thistle *Cirsium palustre*.

Many of the riverbank Alders had leaves with vacated blotch mines of the European Alder Leafminer *Fenusa dohrni* (Hymenoptera, Tenthredinidae).

BIRDS (Terry Whitaker and John Newbould)
Three Oystercatchers in flight, some 20 Swifts and ten Swallows still feeding young were at Low Fremington and House Martin had successfully fledged from Low Barn at Fremington. Just south of Reeth TMW saw a Yellow Wagtail, 12 Greylag Geese, 20 Sand Martin (colonising the river banks), 7 House Martin, 8 Lapwing, a Snipe and 3 Oystercatcher. On the moorland RW and JAN noted Wheatear, Mistle Thrush, Carrion Crow and Common Buzzard. Five Red Grouse and 50 Lapwing flew into the meadow north of the Maiden Castle car park at lunchtime.

MAMMALS AND OTHER VERTEBRATES (John Newbould)
On the evening of 25 July at dusk a still section of Arkle Beck at Reeth Bridge had Daubenton's Bat *Myotis daubentonii* associated with the river, whilst at Low Fremington Common Pipistrelle *Pipistrellus pipistrellus* and Soprano Pipistrelle *P. pygmaeus* were detected. There were plenty of Rabbits *Oryctolagus cuniculus* on the moorland and many Rabbit road kills on the Dale roads. Brown Trout *Salmo trutta* was noted in Arkle Beck (SE042991) and TMW reported Frogs in the slacks below Reeth.

Skerne Wetlands YWT Nature Reserve (VC61) 9 August 2014

INTRODUCTION (Sarah White)
There had been torrential rain overnight but 17 intrepid members nevertheless braved the elements to gather in this remote part of the Hull Valley. They were rewarded with a dry though breezy day and the chance to have a first look at a largely unrecorded new YWT reserve. Jon Traill, the reserve manager, gave an introductory talk about the history of the site as a commercial fish farm and its recent acquisition by the Trust. He is preparing a management plan for the site so the visit was a useful opportunity to set a baseline of species present.

Ten members, representing 13 Affiliated Societies, gathered afterwards at the WI Hall in Hutton Cranswick for tea and to discuss the day's finds. It was agreed that the site was at present rather species-poor, the inevitable consequence of its past intensive management. However, it was felt that it has enormous potential as a wetland reserve, given the right management, and the Trust was congratulated on its bold and far-sighted action in acquiring it. It was suggested that the priority was to excavate some of the areas of willowherb to create shallow open water and,

importantly, plenty of muddy habitats for invertebrates. Recently excavated open areas are often particularly valuable, so there should be a rolling programme of new excavations together with water level control. The many separate small stew ponds could be used to safeguard vulnerable wetland plants now scarce in the Hull Valley. Habitats currently of particular value which should be retained are the trackway, which was used by a colony of Wall butterflies and Fleabane *Pulicaria dysenterica,* which provided an important source of nectar.

There was a vote of thanks to the Yorkshire Wildlife Trust and Jon Traill in particular, for allowing our visit.

FLOWERING PLANTS (Richard Middleton)
With the exception of barely two hectares at the northern end of the site, the vegetation bore the scars of several decades of strict management. Aerial photographs from the time of the commercial fish farm show, as would be expected, that much of the area was clear of vegetation – either access tracks or clear open water. It was the northern section which provided a glimpse of the original wetland plant community with Purple-loosestrife *Lythrum salicaria*, Water Dock *Rumex hydrolapathum*, Gypsywort *Lycopus europaeus* and Blunt-flowered Rush *Juncus subnodulosus* present, albeit in small quantity.

The reserve is of primary interest because of its wetland habitats. The Yorkshire Wildlife Trust should also consider clearing some of the south-facing slopes of the many old railway embankments to encourage the establishment of drier habitats. This would help to increase the total biodiversity of the site.

The ditches and open ponds carried a luxuriant growth of submerged vegetation, if of low diversity, the dominant plants being a thread-leaved Water-crowfoot, probably *Ranunculus penicillatus*, a starwort, Common Duckweed *Lemna minor* and Ivy-leaved Duckweed *L. trisulca* with Canadian Waterweed *Elodea canadensis* and Nuttall's Waterweed *E. nuttallii*. The apparent absence of pondweeds *Potamogeton* spp. was somewhat unexpected. The steep sides to the ponds and drains limited the vegetation severely, although Bittersweet *Solanum dulcamara,* Marsh Woundwort *Stachys palustris* and Common Fleabane *Pulicaria dysenterica* were seen in several places. The drained ponds had sprouted a luxuriant green cover dominated by Great Willowherb *Epilobium hirsutum* along with Bulrush, Reed Canary-grass *Phalaris arundinacea* and Common Reed, presumably nourished by a nutrient-rich substrate.

The fast-flowing West-beck, with its extensive beds of Water Crowfoot, also supported Branched Bur-reed *Sparganium erectum,* Unbranched Bur-reed *S. emersum* and Reed Sweet-grass *Glyceria maxima.*

The site has been extensively planted with sometimes exotic shrubs and trees, the most striking of which were three species of alders – Grey Alder *A. incana* and Italian Alder *A. cordata* as well as the native one, along with a wide range of willows. Other unexpected plantings included a Dawn Redwood *Metasequoia glyptostroboides,* noticed by KW, and Cockspurthorn *Crataegus crus-galli.*

From a botanical point of view any development of this site must include the extensive re-

introduction of significant wetland plants. The fish-farming activities have effectively created a blank canvas with little prospect of any viable seed-bank. Fortunately, the infrastructure for water-level management, essential for fish rearing, still seems to be in place. This, coupled with the many discrete, often linear, ponds would provide an excellent opportunity for the provision of a refugium for the many aquatic plants which are now often confined to very few stations in the vice-county. It could form a valuable educational resource and the experience gained managing the plants under controlled conditions would provide valuable experience to inform the management of more natural sites.

LICHENS (Colin Howes)
A deal of colour was imparted to the day by the proliferation of the golden-orange-yellow *Xanthorion* community at times festooning the trees, a response to the nitrogenous eutrophication of substrates. Concrete posts around the fish ponds were gaily adorned by the brightness of a similar flora.

LEPIDOPTERA (Peter Tannett)
It was a pleasure to see a good number of Wall butterflies, mostly about the tracks which had stone chippings. The list of mainly common species included Gatekeeper and Small Skipper and apart from the Green-veined White were not numerous. Moths noted were also common ones: Yellow Shell *Camptogramma bilineata*, Blood-vein, Common Carpet and the micros Mother-of-pearl *Pleuroptya ruralis,* Pale Straw Pearl *Udea lutealis*, Common Nettle-tap *Anthophila fabriciana,* Satin Grass-veneer *Crambus perlella* and the Horse-Chestnut Leaf Miner.

ODONATA (Roy Crossley & Peter Tannett)
Brown Hawker dragonflies were patrolling the River Hull and there were good numbers of Ruddy Darter *Sympetrum sanguineum*. The occasional Southern Hawker and single examples of Common Darter and the Blue-tailed Damselfly were seen, the torrential rain of the previous day doubtless limiting numbers.

PARASITIC HYMENOPTERA (Bill Ely)
22 ichneumons had been recorded from TA05 before this meeting and that was raised to a more respectable 42 by Roy Crossley and myself. Most of those found on this Excursion are proving to be common in Holderness but the campoplegine *Campoplex restrictor* that I collected and the Metopiine *Triclistus lativentris* that Roy collected are new to Yorkshire.

Campoplex punctulatus, which we found east of the River Hull, is the fourth Yorkshire record. The pimpline *Fredegunda diluta,* which has a scatter of records across the low-lying south-east edge of VC63, the Humber estuary and Holderness, was found on the river bank. It has been reared from the Brown-veined Wainscot *Archanara dissoluta*, whose larvae feed internally in Reed stems, at nearby Hornsea Mere. Another campoplegine *Diadegma crataegi,* which parasitises leaf-mining gracillarid moths (*Parornyx* and *Phyllonorycter*) on Hawthorn, Blackthorn *Prunus spinosa*, apples, birches and oaks was in several places east of the Hull but, despite its wide host range, was only the seventh Yorkshire record. The ichneumonine *Barichneumon heracliana* has several records in VC63 and a few on the Holderness coast but this was the first inland record for VC61. The large figitid wasp *Callaspidea defonscolombei* was west of the Hull and is new to Holderness; the only previous record for VC61 was from Allerthorpe Common in

1950. Along the ditch west of the Hull was a young gall caused by *Andricus grossulariae,* one of the wasps which affect developing acorns. This wasp is a recent coloniser of the UK and I found the gall a couple of times in 2011 in Hull and near Hornsea but this is just the third Yorkshire record. Roy collected the proctotrupid wasp *Exallonyx minor*, which is new to VC61, while *E. ater* was east of the Hull and is new to Holderness, the only previous VC61 record is from Flamborough. The four procotrupids collected are parasitoids of beetle larvae, the four diplazontine ichneumons and *Callaspidea* are parasitoids of hoverfly larvae, *Cylloceria melancholica* is reported to parasitise craneflies and the rest attack lepidoptera caterpillars, though the very common pimpline *Itoplectis maculator* is also able to attack other ichneumonoid larvae which are parasitising these hosts.

OTHER INSECTS (Roy Crossley)

The main period of activity of many fly families is over by mid-to-late August in most years but, following this exceptionally hot summer, that time had been reached by the beginning of the month. Consequently I did not expect that there would be much to report from this meeting and furthermore, due to the rampant growth of vegetation this summer, access was restricted to the paths throughout much of the site.

In the event, the list of nine dolichopodids was as much as could be expected and most of these were found in the vicinity of the ponds at the north end of the site. Seven or eight hoverflies were also recorded and the numerous patches of Fleabane attracted many of these nectar-seeking flies. The black snail-killing fly *Sepedon sphegea* was found near the ex-trout hatchery. The flies we recorded are common generalists but are worthy of note as Skerne is in an under-recorded 10km square and all records will be 'firsts' for the Reserve list!

The extensive western marsh, which was inaccessible due to the density of the vegetation, and the north ponds, are likely to be the most productive areas for many dipteran families in the next few years, and this initial foray served to whet the appetite for further recording visits at more auspicious times in the field season.

High summer is the time when many bugs mature, having spent the previous months developing from over-wintering eggs. Adult Woundwort Shieldbug *Eysarcoris venustissimus,* Blue Shieldbug *Zicrona caerulea* and immature Green Shieldbug *Palomena prasina* were present with the Tree Damsel Bug *Himacerus apterus* and many plant bugs. There were few beetles about and the only ladybirds seen were individual Harlequins *Harmonia axyridis*.

SPIDERS (Colin Howes)

A population of the orb-web spider *Larinioides sericatus* was established on tubular metal railings around a deep water feature. This waterside arachnid, not of vegetation but of the built environment, preferring concrete, brickwork and metal structures, is indicative of the site's former industrial status.

MOLLUSCS (David Lindley)

In total 30 molluscs were found on the reserve, the majority of which were unsurprisingly freshwater species. Due to its size it was not possible to examine the whole reserve and the area to the north-west side of the bridge was concentrated on. In general chalk streams can be very poor for molluscs but, due to the number of man-made ponds from the old trout farm, variety

increased. It was interesting to note that both Margined Ramshorn and Keeled Ramshorn *Planorbis carinatus* were to be found in many of the ponds and Common Bithynia *Bithynia tentaculata* was particularly common. Flat Ramshorn *Hippeutis complanatus* was only seen in a small eutrophic area near the apex of the reserve together with the common Red-crusted Pea Mussel *Pisidium personatum*. A single specimen of the Giant Pea Shell *Pisidium amnicum* was found in the feeder stream. This is normally quite heavily sculptured but it was interesting to note that the specimen found was completely smooth. A single fresh valve of the Duck Mussel *Anodonta anatina* was found in dredgings from an area of the feeder stream.

BIRDS (Ken White)

August is a quiet month for birds but despite this 25 were recorded. A particular highlight was Kingfisher, heard calling repeatedly throughout the day as birds flew up and down the river. Jon Traill said there were two resident pairs and, judging by the amount of calling, there were several young birds on the wing. Other breeding birds were Whitethroat, Kestrel, Pheasant, Moorhen (immatures of all these were seen), while the alarm call of Sedge Warbler was heard and predated eggs of Woodpigeon were found. Other notable sightings were several Stock Doves, Grey Heron, Cormorant, Little Grebe, Linnet, Swallow, House Martin and Sand Martin.

NON-AVIAN VERTEBRATES (Colin Howes)

Brown Trout and Grayling *Thymallus thymallus* were frequent in the river in the shade of bridge and overhanging trees. On an embankment by the fish (stew) ponds, a Grass Snake *Natrix natrix* basked on a sunlit pile of vegetation, the only other herptile noted being one of the imported marsh frogs, possibly *Pelophylax ridibundus,* populations of which began to occur in a number of waters in the Hull Valley from the 1980s. Fish stocks imported from Europe could well have been the inadvertent origin of this isolated population.

Mole *Talpa europaea* hills were on embankments and in nearby pastures. A dead Pygmy Shrew *Sorex minutus* was found and shrew pelvises and unidentified rodent incisors were discovered in a bird of prey pellet. Two batches of black to dark-purple Fox droppings were largely composed of bramble pulp and achenes and Hogweed *Heracleum sphondylium* seeds.

Roe Deer slots formed tracks across recent unvegetated dredgings from an adjacent drain. Interestingly, concentrations of herbivore droppings were all from Roe Deer, suggesting that the primary mammalian grazers on site were deer rather than lagomorphs. Apart from a long-dead carcase of a Rabbit no lagomorphs were seen, though traces were discovered in fox droppings. The sighting of a Stoat indicated that a population of Rabbits, normally its staple food, may have been present somewhere in the vicinity.

Near a pile of waste barley, Brown Rat *Rattus norvegicus* burrows pock-marked an exposed ditch side. In one of the stew ponds a Water Vole *Arvicola amphibius* was seen diving and signs were in the form of a grazed tussock of Reed Canary-grass and three droppings on a wooden jetty. No latrines or grazed lawns were noted by the river or drains.

Yorkshire Naturalists' Union Conference

The Yorkshire Naturalists' Union will not hold a conference in 2015 but plans are already underway to organise a conference for 2016. It will be held on a weekend date in late March at the National Science Learning Centre in York, which received very positive feedback as the venue for our previous conferences. The YNU's Education Committee has proposed the topic of species names, taxonomy and evolutionary relationships in relation to natural history studies, and some excellent potential speakers have already been identified.

If you would like to help us organise the conference, we are looking for volunteers to:

Contact speakers and plan the structure of the day

Chair a session at the conference

Write up the conference proceedings for publication in the *Naturalist* and on the YNU website

Please contact Sarah West, Chair of the Education Committee, on sarah.west@york.ac.uk if you would like to be involved.

National Forum for Biological Recording Conference

The National Forum for Biological Recording and the British Ecological Society are organising a conference at Sheffield University on the 23rd to 25th April 2015 on the theme *'A Question of Ecology – answers from biological recording'*.

Biodiversity information is crucial to understanding ecological relationships and supporting conservation effort in a changing climate. *A Question of Ecology* will showcase original work which is advancing our understanding of species and ecosystems through accurate observation and recording, and celebrate the work of naturalists who are uncovering new ecological knowledge from their own records. There will be presentations, software demonstrations, a poster exhibition, quickfire talks and a discussion workshop on how to foster collaboration between the professional research community and volunteer recorders on the collection and interpretation of biological records to answer ecological questions.

The keynote address will be given by Professor Kate Jones, Chair of Ecology and Biodiversity at University College London and Chair of the Bat Conservation Trust, on the subject of 'Technology for Nature?'.

On Saturday 25th April there will be a field trip to Thorne and Hatfield Moors, which form the core of the Humberhead Peatlands NNR, the largest lowland raised mire system in the UK and the beating heart of the Humberhead Levels Nature Improvement Area.

We hope that many YNU members will attend the conference and the field meeting. For further information, including the programme and booking information, visit www.nfbr.org.uk or contact Paula Lightfoot on p.lightfoot@btinternet.com.

YNU Calendar 2015

Up-to-date information can also be found on the YNU website at:
www.ynu.org.uk/events/general

Apr	11	Conchological Section field meeting. Semerwater. Meet at 10.30 in the parking area at the north-east end of the lake SD921875.
	23-25	National Forum for Biological Recording - Conference – see previous page.
May	9	Bryology Section field meeting VC65. Sedburgh area. Meet at 10am on Howgill Lane at SD654923.
	9	Conchological Section field meeting. River Derwent at Low Hutton. Meet at 10.30 in car park east of railway on bank near suspension bridge SE764677. Joint with YNU Freshwater Biology Section.
	16	**VC61 Excursion** Jeffrey Bog YWT reserve.
	19	Entomological Section field meeting Ox Close Wood, East Keswick. By invitation of the East Keswick Wildlife Trust. Meet at 10:30am at Crabtree Lane car park at the junction with the A659 at SE362454 – marked on the O.S.map). See articles in *The Naturalist* 1084 for information on the site.
	30	Botanical Section field meeting VC64. Bishop Wood nr Selby. Meet at 10.30 at the entrance at SE555334.
Jun	13	**VC62 Excursion** Upper River Rye, Hawnby.
	27	Botanical Section field meeting VC61. Stillingfleet nr Selby. Meet at 10.30 by the church at SE593410.
July	11	**VC63 Excursion** Worsborough near Barnsley.
	24-25	**VC64 Excursion** Trough of Bowland.
Aug	1	Botanical Section field meeting VC63. Silkstone Fall Woods and Transpennine trail. Meet at 10.30 on the roadside at Silkstone Railway Station at SE290043.
	1	Marine and Coastal Section field meeting jointly with the YWT. South Landing, Flamborough. Meet at 9.30 at the Living Seas Centre NZ809160. Morning on the shore, afternoon in the centre using the microscopes. Low water 12.00 mid-day. Advance booking is necessary – contact p.lightfoot@btinternet.com
	2	Marine and Coastal Section field meeting jointly with Darlington and Teesdale Naturalists' Field Club. Saltburn. Meet at 9.30 at the car park on Saltburn Rd NZ668215. We will be on the rocky shore at Saltburn Scar until 12.00 mid-day. Advance booking is necessary – contact p.lightfoot@btinternet.com
	7-8	**VC65 Excursion** Whitsundale near Keld.
	15	Marine and Coastal Section field meeting jointly with the National Trust. Ravenscar. Meet at 10.00 at the Ravenscar Visitor Centre NZ979016 (YO13 0NE). This is part of the NT's Coastal Bioblitz programme. Low water 11.30.
	16	Marine and Coastal Section field meeting jointly with Whitby Naturalists' Club. Meet at 9.30 in the car park in Staithes NZ781185. Low water 12.00 mid-day.
Sept	5	Conchological Section field meeting. Fridaythorpe area. Meet at 10.30 at the side of the road near to the village pond in Fridaythorpe SE874591.
Oct	3	Conchological Section field meeting. Ryedale area for Murton Wood and Park scar. Park off road at 'T' junction at SE536882.
	10	Bryology Section field meeting VC62. Kilburn. Meet in the White Horse car park SE514811.

Yorkshire Naturalists' Union
c/o NEYEDC, St William College, 5 College Street, York YO1 7JF
Tel: 01904 641631 Email: membership@ynu.org.uk
Website: www.ynu.org.uk
Registered Charity No. 224018

The Naturalist

ıis publication is issued free to individual members of the Yorkshire Naturalists' Union and to filiated Societies. The Editorial Board of *The Naturalist* is currently:

otice to contributors

ntributors should indicate whether they wish their manuscripts to be subjected to anonymous peer review. other manuscripts will be reviewed by the Editorial Board who at their discretion may send them to third rties for comment and advice.

ginal articles should be submitted electronically as an MS Word document to Dr A. Millard at nillard@leedsmet.ac.uk.

ease look at a recent issue of the journal for a general idea of how to present your article. Also see *The turalist Guide to Consistency* on p77 of *The Naturalist* 1079 and please **avoid** the following:

- using any paragraph formatting and line spacings other than single.
- using tabs to tabulate information (please use MS Word table format or separate the column entries in a single row with commas and enter a paragraph mark at the end of the row).
- inserting any figures, graphs or plates into the text; indicate their proposed locations in the text and send as separate files.

od quality, high resolution images are very welcome and should be sent as .jpg files, with a separate MS rd file containing the caption and name of the person to whom the image should be attributed.

lectronic submission is not possible, contributions should be sent to Dr. A. Millard, Woodland Villas, 86 chelor Lane, Horsforth, Leeds LS18 5NF (Tel. 0113 258 2482)

ntributors should ensure the accuracy of reference citations. The Editorial Board and Council accept no ponsibility for opinions expressed by contributors.

py Dates:
il issue - **14 February**; August issue - **14 June**; December issue - **14 October**

ISSN 0028-0771

Yorkshire Naturalists' Union

DUFFIELD digital
Printed by Duffield Digital
www.duffieldprinters.co.uk
Woodland CARBON
www.woodlandcarbon.co.uk